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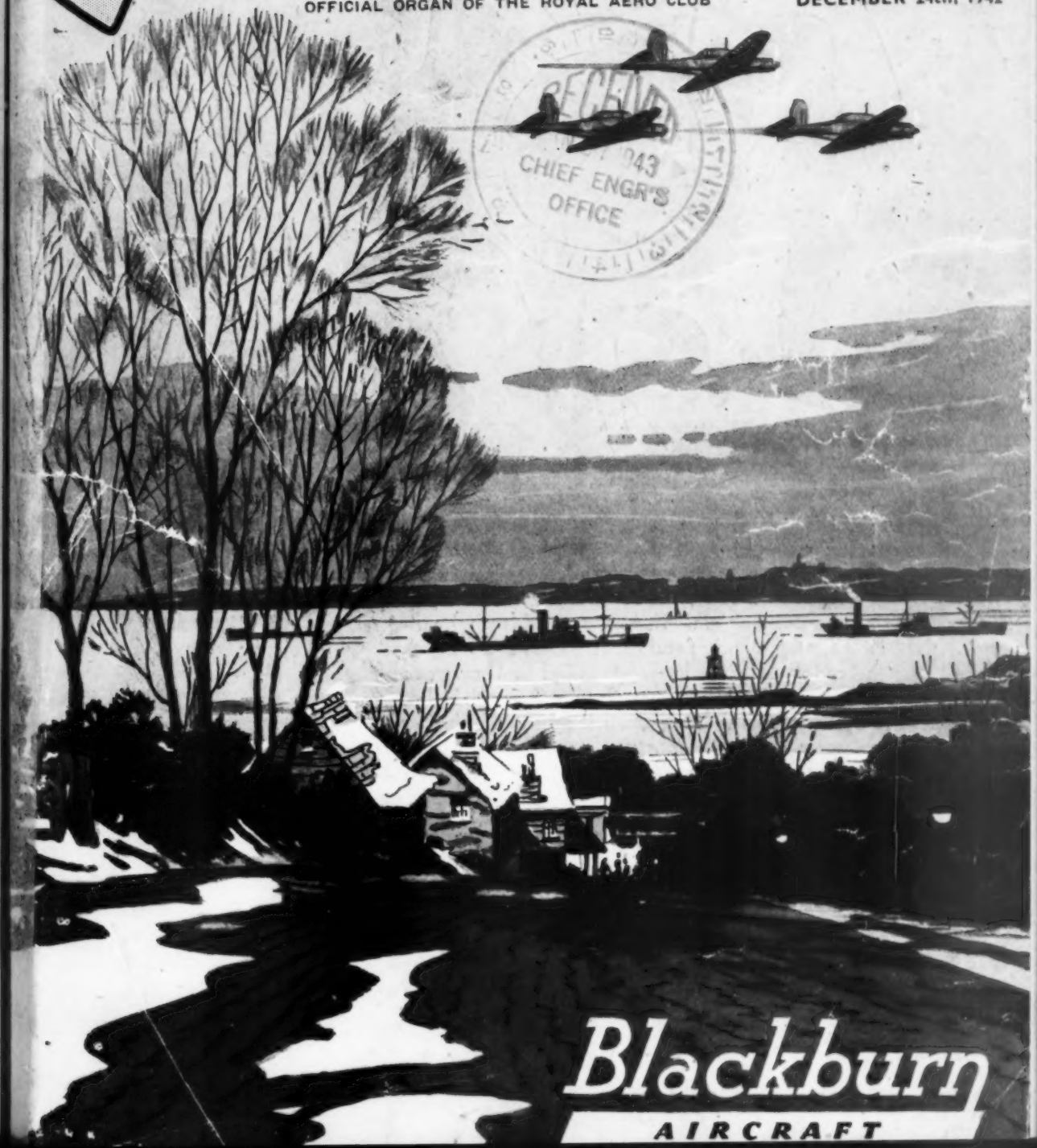

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FLIGHT and The AIRCRAFT ENGINEER

First Aeronautical Weekly in the World : Founded 1909

Editor C. M. POULSEN

Managing Editor G. GEOFFREY SMITH, M.B.E.

Chief Photographer JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1
Telegrams: Truditur, Sedist, London. Telephone: Waterloo 3333 (35 lines).

COVENTRY :	BIRMINGHAM, 2 :	MANCHESTER, 3 :	GLASGOW, C.2 :
8-10, CORPORATION ST.	GUILDHALL BUILDINGS, NAVIGATION ST.	260, DEANSGATE,	26B, RENFIELD ST.
Telegrams: Autocar, Coventry.	*Telegrams:* Autopress, Birmingham.	*Telegrams:* Iliffe, Manchester.	*Telegrams:* Iliffe, Glasgow.
Telephone: Coventry 5210.	*Telephone:* Midland 2971 (5 lines).	*Telephone:* Blackfriars 4412.	*Telephone:* Central 4857.

Registered at the G.P.O. as a Newspaper.

No. 1774. Vol. XLII. December 24th, 1942. Thursdays, One Shilling

The Outlook

On from Agheila

SOMETHING like a so-called "sealed plan" has apparently been worked out for the employment of aircraft against Rommel. Whenever the German commander makes a stand, or makes a show of standing, the Allied Air Forces work in three stages. First, they pound all landing grounds within their range, with the object of securing their own freedom of action in subsequent operations. While doing this they may be likened to long-range artillery. The second stage is when the Empire ground forces advance to the attack. Then the fighter-bombers and light bombers assume the role of field artillery, and help the ground troops to blast a way into the position. The third stage is when the enemy falls back; then the aircraft transform themselves into the modern equivalent of cavalry and hurl themselves on to the lines of retreat. This sequence of tactics was first practised at El Alamein, and was copied at El Agheila.

In the third stage, even more than in the preliminary ones, no other arm can take the place of aircraft. Rommel has shown that a modern mechanised army can disengage itself and retire when its commander so desires. Minefields and demolitions forbid a headlong pursuit by the tanks and armoured cars of the victors. These can only follow at a foot pace behind the infantry and engineers who slowly clear the way. Only the aircraft are immune from the effect of these hindrances, though even they have to be cautious when occupying a new landing ground.

The air forces working with the Eighth Army were not entirely successful in holding up Rommel's supplies during his late advance, but they have been invaluable during the pursuit, when many of the Axis vehicles have had to use the single coast road.

Moreover, the value of air reconnaissance must never be overlooked. Reports that Rommel had evacuated Agheila because he had been outmanœuvred were merely wishful thinking by enthusiastic war correspondents. As a matter of fact, Gen. Montgomery knew well, and must have learnt it from air reconnaissance, that only a strong rearguard was holding the position in front of Agheila, and his staff had been able to calculate accurately the day on which this rearguard would evacuate the position. Nevertheless, as the position itself was strong, the General had to pause and build up a force sufficiently powerful to overwhelm it; and Rommel gained so much time. There may be other stands by the German rearguard.

In the meantime, the harbours of Tripoli, Tunis and Bizerta are being heavily hammered by bombers from Malta and by others from Gen. Eisenhower's Army. Too much must not be expected from these attacks. Since the Battle of Egypt began, the harbour of Benghazi was raided 15 times by Allied bombers, but, fortunately as it turned out, the damage done was not too great, and was speedily repaired. Benghazi is now doing yeoman service in supplying the Eighth Army. It is to be hoped that before long the Allies will find Tunis and Bizerta also of great use to themselves.

The Future of Air Transport

THE House of Commons has just discussed the future of commercial air transport at a recent sitting, and indeed it was time that the representatives of the nation gave some thought to the matter. There can, of course, be no question of diverting any part of our war effort to the needs of any trading interests in the coming days of peace. Any attempt to do so would be largely futile.

Likewise, the form which development is to take must depend upon the political state of the world after the war, and that is still an unknown quantity. Neverthe-

less, serious consideration of the subject now was very desirable.

The early days of commercial flying were hampered by the fact that men with expert knowledge of aircraft were untrained in the problems of transport and traffic, while commercial interests were blankly ignorant of the possibilities and limitations of aircraft. For that reason Sir Samuel Hoare, the first Air Minister who devoted his attention to the subject, did what was probably the best thing in setting Imperial Airways to work to learn how to combine the two interests. A great deal of useful data had been amassed by the time that the British Overseas Corporation came into existence. In this connection it should be remembered that Sir Samuel Hoare and the late Lord Thomson were primarily Ministers for civil flying, as in their day little could be done to bring the Royal Air Force up to strength.

At the present moment the position is reversed, and the Secretary of State for Air is primarily the head of a fighting Department. In the early days there was ample reason for putting all forms of flying under a single direction, but that reason may not endure for all time. In the future it may well come about that the organisation of the R.A.F. and the development of commercial air transport will each be such a big job as to demand the full time of a separate Secretary of State. That would, however, rule out any idea of putting the latter interest under the Board of Trade, which would be most unfitted to deal with it. As. Capt. Balfour said, we must learn from the past and not be prejudiced by what had gone before in our willingness to introduce new methods to deal with new problems.

Politics had too much influence on the development of external air transport in the past, and it is a matter for consideration whether the principle that every country should have national rights over the air above its territories ought to continue. Co-operation in some form between the air lines of different countries seems a much more desirable principle, though healthy competition should be allowed to exert its beneficial influence. *Flight* has already suggested the setting up of a Parliamentary Committee, formed of members of both Houses, and also including all interests concerned, with sub-committees to deal with various aspects of the question. Mr. Simmonds took the same line in the debate on December 17th, and it deserves serious consideration.

Mr. Perkins, who opened the debate, referred to the *York* as a machine designed as a bomber and converted to use with the Army. When Captain Balfour came to reply, he could not bring himself to mention by name this terribly secret machine, but referred to it as "that particular aircraft," and said it was wrong to describe it as a conversion. It was, in fact, a virtual redesign. Next week we shall deal with the debate in more detail.

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AIRSPEED OXFORD MK. II : A new flying picture of the standard multi-engined flying training aircraft of the R.A.F. The engines are two 375 h.p. Armstrong Siddeley Cheetah X radials. Oxford Mk. I has a gun turret for gunnery training; Mk. 3 is an air ambulance; Mk. 4 is an experimental type with De H. Gipsy engines; Mk. 5 has Pratt and Whitney Wasp engines.

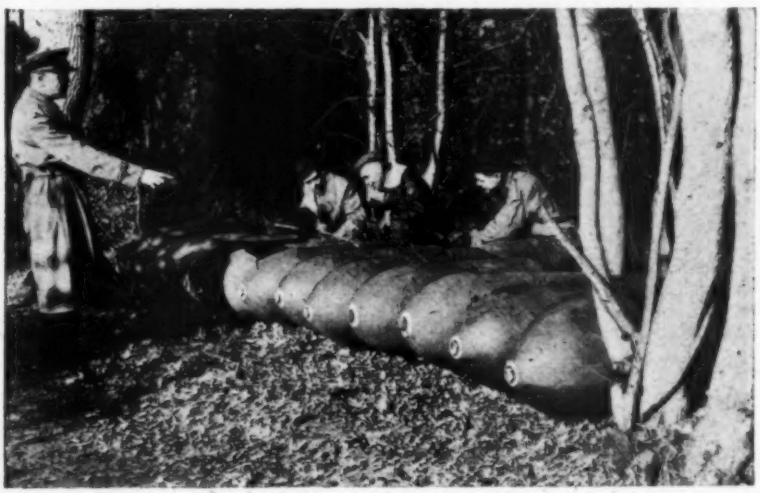
War in the Air

OVER THE WAVES. Bostons of Bomber Command crossing the Channel at 0 ft. to attack German troops in occupied territory.

The Papua Victory : Axis Need for Transport Aircraft : The Situation in Tunisia and Tripolitania

THE last stand of the Japanese on the beaches round Gona and Buna was a grim affair. Though Lae and Salamaua remained in Japanese hands there has been little or no indication that the soldiers on the few strips of beach received help from the air. Some supplies and ammunition were dropped, but of these there was no great need, for the victorious Australians found ample stores when they finally stormed the positions. The Allies, on the other hand, were well off for aircraft, and they kept the dwindling numbers of the stubborn enemy under constant bombardment by day and night. The captured beaches were in a horrible state, with unburied dead lying about, and everyone who has lived in the East knows what that means. Towards the end some Japanese troops were seen to be wearing gas masks.

In their most recent attempts to get reinforcements ashore the Japanese have not used transport ships, but have conveyed their soldiers on destroyers and cruisers. Several attempts to land men at Gona and Buna in that way were defeated, mainly by air action. About the time these two places fell a convoy of two cruisers and four destroyers were spotted off Madang, to the north-west of Lae. They were steaming in the direction of Gona, and were promptly attacked by Liberators and Fortresses. The Japanese did not push on to the doomed beaches of Gona and Buna, but commenced to land by night at points farther to the north-west. The landing barges were fiercely attacked by many types of Allied aircraft, and the Allies have a good assortment of types in the Pacific. Fortresses, Havocs, Airacobras, and Beaufighters were all mentioned as having been in action against the barges, and the slaughter was great. In one group of barges 20 were either sunk or set on fire. Nevertheless, a certain number of Japanese did succeed in getting ashore, but it is believed that the aircraft prevented this attempt from becoming a serious threat to the Allied position.



DOWN IN THE FOREST. Armourers of the U.S.A.A.F. prepare 1,000 lb. bombs under cover of trees.

The Germans in Russia

THE call upon the German and Italian supplies of transport aircraft has been very heavy of late. Large numbers have been busy between Sicily and Tunisia, while at the same time very many have also been needed to maintain communication with the forces of Gen. Hoth at Stalingrad. Those forces are now the besieged, no longer the besiegers, and all ground communications between them and their bases have been cut by the Russians. Consequently everything that reaches Hoth has to go by air, and the casualties from Russian fighters have not been light. It was mentioned last week in these notes

that the Germans last year succeeded in keeping Staya Russa adequately supplied by air, but then they were able to use all their Ju 52s for the one purpose. Now there is the drain in the direction of Africa, which complicates their problem. Perhaps Mr. Churchill was modest when he mentioned 1,000 transporters as something which he would very much like to have. The R.A.F. could usefully employ almost any number of such aircraft. The Americans, it is hoped, have plenty of Commandoes and other types in that class, and they are larger and faster than the Ju 52s. In due course the R.A.F. will profit from the American supplies.

The Tunisian Position

ON Sunday, December 13th, targets at Tunis, especially the port, had to endure the heaviest air raid which had been made up to that time. There may have been heavier ones since. The Axis position in Tunisia is far from happy. For a short time, when the British First Army had outrun its fighter cover for a while in a quite proper attempt to seize the main centres in Tunisia before the Axis could build up strength there, the Germans and Italians had the best of it in the air, which meant that they also had the best of it on the ground. Since the British withdrawal from Tabourba things have altered. The short-range Axis fighters can no longer dominate the air, and consequently the dive-bombers ceased from troubling. Allied fighters are moving up as fast as bad roads and bad weather allow. It has been estimated that not more than 200 enemy operational aircraft were based in Tunisia, of which more than half were fighters. There were also some 30 dive-bombers, but not many normal bombers, as the two classes mentioned above were most suitable for taking part in the land battles. Of these 200 machines probably not more than two-thirds would be in serviceable condition at any time.

The troubles of the Axis during this campaign to hold Tunisia must have been more acute than those of the Allies. The Axis object can only be to fight a delaying action while strengthening their defences along the coast of Southern Europe; that is, mainly in France and Italy. Rommel's tactics of retreating and fighting rearguard actions must have the same strategic object, for the German chances of reconquering northern Africa, or even of holding Tunisia for long, are negligible. But gaining time is important to them, even at a great sacrifice, and the sacrifices have already been great. The Royal Navy is active in the narrows between Sicily and Bizerta, though it does not hurry to publish news of its successes. The Allied Air Forces and naval aircraft are more conspicuously busy. Long-range fighters constantly take toll of the transport aircraft.

TUNNEL BUNGERS : Sqn. Ldr. J. R. G. Ralston, D.S.O., D.F.M. (right), and Flt. Lt. S. Clayton, D.F.C., D.F.M., who, by a nice piece of work in their Mosquito, slipped a bomb into the mouth of a tunnel while a goods train was passing through. They then bombed the other end to stop it up.

Malta is part of the Middle East Command, and the heavy bombers which are reported from Cairo as having been at work on Tripoli, Tunis, and Bizerta no doubt come from that remarkable island; while others from Gen. Eisenhower's forces have joined hands with them in the good work. Malta does not seem to have had many hostile visitors during the first half of December, although it is known that there are strong contingents of the *Luftwaffe* in Sicily. These contingents have been almost uncannily quiet, which may mean that they are

BOMB RATIONS : The bomb train leaves four 500 lb. bombs for each Mosquito as it passes by. In this view the exhaust muffs for night work and the bomb aimer's clear vision panel are shown.

HEAVIES IN THE MIDDLE EAST. Bombing-up a Handley Page Halifax in the Western Desert.

short of fuel or of some other requisites. It is very satisfactory to know that in Malta there are ample supplies of fuel for all requirements for a long time to come.

Added to the activity in the western Mediterranean, other squadrons of the Middle East Command, including the Army Air Force of the United States, have been starting off from Egypt to bomb Naples, Crete, and air bases in Greece and the Dodecanese.

Rommel Caught Napping

IT has often been suggested that air reconnaissance must make surprise strokes on the ground impossible in war. Such a theory received a tremendous shock when General Montgomery sent out a flanking party into the desert with orders to get ahead of Rommel's retreat and come in unexpectedly on his flank. The movement has succeeded, and the British flanking party cut off a substantial part of the Axis rearguard. The stroke was brilliant, but it was also amazing in its success. It is true that the *Luftwaffe* contingents left at Rommel's disposal are not strong in numbers, and have suffered very heavily at the hands of the Allied Air Forces. The German airmen seem to have become dispirited, and the Italians reached that stage long ago. It only required that one machine should sight the British flanking movement and send off a wireless message to spoil the surprise element of the flanking attack. Even so, it might still have been too late for the Afrika Korps to have taken any useful steps to avert the coming blow, but from all the reports yet to hand no warning from his aircraft reached the German commander. He evidently did not expect an attack from that quarter, and so, it seems, no steps were taken to give warning if anything of the sort were to be attempted. To be caught napping like that is a severe blow to Rommel's reputation as a gifted commander.

BARBER OF UKRAINE. A close shave at a dispersal point on a Russian fighter station. In the background is an I26. The landing ground has been made from a maize field.

Of course, every possible preliminary step had been taken to focus all attention on the coast road and its auxiliaries by which the Axis forces were retreating, and the Allied air squadrons made a particularly vigorous effort to keep the minds of the enemy busy. The ground strafing along the road rose to a great crescendo, and in places the road was more or less blocked by the vehicles which had suffered from the bombs and guns of the Allied aircraft. This slowed up the pace of the German retreat, and gave more time for the flanking column to get into position.

Deception

INCIDENTALLY, the secret was very well kept, and recent communiqués from the Eighth Army laid stress on the difficulties of making a rapid pursuit when minefields had been laid in the way. As those difficulties were very real, there was no reason why the enemy should not accept the British statements as literally true. The Germans are very capable soldiers themselves, but they are apt to discredit ability in their opponents. By this time Rommel ought to have learnt that Generals Montgomery and Alexander are quite capable of making brilliant movements, but he has evidently not yet grasped that fact with sufficient clearness.

In the meantime the Allies' hammering of every port by which the Axis troops in Africa could get help of any description has continued without abatement. Tripoli is said to have been made almost unusable for the time being, and the canal which joins the harbour of La Goulette to Tunis was partly blocked with sand and rubble displaced by the Allied bombs. It may be cleared before long, but every hindrance to the enemy is worth while. On the other hand, Allied facilities have been improved by the use of numbers of American transport aircraft (and some Bristol Bombays are reported to be at work, too), which hurry supplies up from bases to both the forces now working towards each other from Tunisia and Tripolitania.

The Home Front

WHILE the Mediterranean is the focal point of interest, it is natural that comparatively little interest should be taken in the Home Front in Great Britain. It is clear that the bulk of German bombers have moved off to the South of Europe, but a strong fighter force is still left in northern France, while the small number of bombers still available there makes periodical raids across the Channel, mostly by night. These raids have caused a few deaths and also injuries, but the raiders have not all got away scathless. At the same time, British raiders go frequently across the Channel by daylight and shoot up railway engines and other aids to enemy transport.

HERE AND THERE

Float Hooks

A PARTICULARLY interesting feature of the Curtiss Seagull seaplane on this page is the hook under the forward curve of the single float.

In *Flight*, November 26th, the function of this hook was disclosed in an article headed "Catapult Training." When the seaplane comes alongside to be hoisted aboard, a grass line, terminating in a semi-submerged net, is trailed from a boom and the aircraft taxies on to the net and is then allowed to drift back so that the hook engages in the net. The length of the grass line is so arranged that the seaplane is then exactly beneath the hoist.

Man-power in Aircraft Works

A BOARD to investigate and advise upon the more economical use of man-power and woman-power in the aircraft industry has just been appointed by the Minister of Aircraft Production, Sir Stafford Cripps.

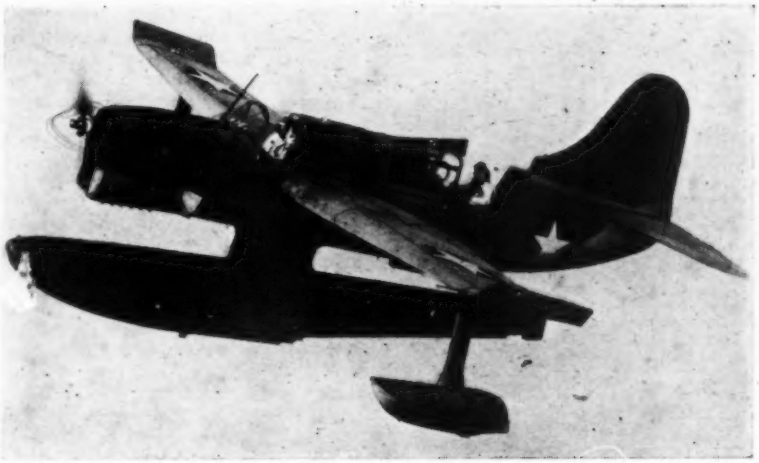
Sir Charles Bruce-Gardner is to preside over the board, on which will also serve Mr. Frank Chappell, of the A.E.U., and Miss A. G. Shaw, the chief supervisor of women at Metropolitan-Vickers Electrical Co., Ltd., Manchester, and they will consult with joint production committees and other advisory bodies on the use being made of labour and plant and on hours and conditions of work from the point of view of efficiency.

Queuing Up to Fly

AIRLINES in America seem to be experiencing more demands from potential travellers than they can handle these days.

Doubtless war conditions are responsible, but here's how an airline station manager put it to one of our American contemporaries:—

"I can remember the day," he said, "when we'd solicit a man for weeks to get him to ride our airline; we'd even carry his wife for nothing. I never thought I'd see the day when we'd be standing out there with a club trying to keep the passengers away. But that's how it is now!"



HANDSOME IS . . . . . ! Not, perhaps, the prettiest of aircraft, the Curtiss Seagull (SO3C) is the U.S. Navy's latest floatplane in the "scout-observation" class and is Ranger powered and equipped for catapult launching. Note the sharply upturned wing-tips and the hook under the float mentioned in the adjoining paragraph.

From Martins to Lancasters

VICTORY AIRCRAFT, LIMITED, a Crown company headed by J. P. Bickell, of Toronto, has taken over the former National Steel Car Aircraft plant at Malton, Ontario, and will own and operate it henceforth, it is announced officially.

The plant—expropriated by the Dominion Government—is engaged principally in manufacturing Lancaster bombers. It also makes, assembles and overhauls aircraft parts. The factory is regarded as one of the Dominion's most important producers of aircraft.

National Steel Car held a production order for twin-engined Martin bombers before switching last November to the manufacture of the heavy, four-engined Lancasters, a type which is one of the four important aircraft on Canada's production schedule for 1943.

Greetings from Stalag Luft III

FLIGHT has received, through the medium of the Press Association, the following Christmas greeting from Group Captain J. Macdonald, now in an R.A.F. prisoners of war camp in Germany:

"Christmas Greetings and Best Wishes for the New Year from all ranks Prisoner of War at Stalag Luft III, Germany, to all their friends and comrades in the Royal Air Force, the Sister Services and the Allied Services at Home and Abroad."

On behalf of our readers in the Forces we take this opportunity of thanking all ranks at Stalag Luft III and sending them the best of all wishes—that they may be back with their own people before long.

"*Flight*" photograph.

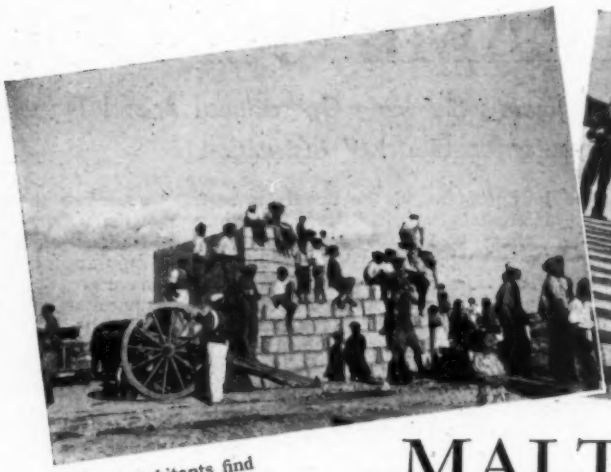
"TAKE!" The fine work of the R.A.F. Film Unit is well known. Here we see one of the unit's Hudsons "shooting up" a group of fighter pilots on their own airfield.

Gun Recoil Absorbed in Undercarriage Cylinders

SHOCK absorbers of the undercarriage would be used to cushion the reaction when a light cannon or a heavy machine gun is fired from an aircraft if an invention made by Carlos C. Goetz, of New York City, is adopted. A United States patent (No. 2,299,227) protecting the idea was issued in October.

Back-kick of the gun, or guns, is transmitted to the shock absorbers by pivoted levers of a shape and length to extend from the gun breech to the absorber pistons when the undercarriage is in the fully retracted position.

The inventor points out that the absorbers can be used for the two-fold function of absorbing landing and gun recoil shocks, because the guns are fired only when the plane is in flight and the undercarriage is retracted.



The local inhabitants find vantage points from which to watch the ceremony.

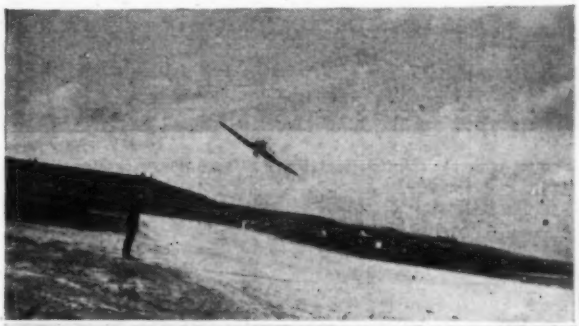
General Lord Gort, V.C. (Right) presents the new airfield to Air Vice-Marshal Park

MALTESE CEREMONY

Celebrations at Opening of New Airfield on the George Cross Island

MALTA now possesses a modern airfield complete with runways to take any of the many landplanes flown by the Royal Air Force and Fleet Air Arm.

At the opening ceremony, General Lord Gort, V.C., Governor of the Island, officially handed the airfield over to Air Vice-Marshal Park, C.B., M.C., D.F.C., A.O.C. Malta, who accepted it on behalf of the Royal Air Force. Air Vice-Marshal Park then completed the ceremony by taking off from the main runway on the Hurricane O.K.2, which is one of the aircraft he uses as a taxi for duty flights. A party held in the control tower afterwards marked the end of a ceremony usually associated with peacetime, but here celebrated under the very noses of the *Regia Aeronautica* and the *Luftwaffe*, who have tried so hard to reduce the island. There is something piquant about an island that can plan celebrations amid such turmoil.



(Top left and right) Air Vice-Marshal Park in his Hurricane O.K.2, and taking off from the new runway. (Bottom left) Captain the Hon. Guy Russell, R.N., Chief of Staff, joins the party on the control tower. (Bottom right) On the control tower after the ceremony. Air Vice-Marshal Park is seen chatting to Lord Gort.

BRISTOL AIRFRAME SCHOOL

Special Courses for Riggers and Engineer Officers : Servicing Operational Bristol Types : Airframes, Turrets and Layouts for Students' Instruction

BRISTOL aircraft and engines have never been more complicated than any other types, but the company —through 32 years of aircraft and engine building— has always made a great point of seeing that users know all there is to know about servicing and overhaul. This has been one of the most important features in building up their enviable name for reliability. Now, in the middle of the greatest air war, the Bristol Aeroplane Co., Ltd., run an airframe school at which anyone whose business it is to keep Bristol aircraft serviceable can come and pick up the specialised knowledge required to supplement the standard training.

In the classrooms at this school may be seen all ranks, from A/C.2 to Wing Commander, each learning his way around Blenheims, Bisleys, Beauforts and Beaufighters. It should be emphasised here that these students are already fully trained and qualified engineers before attending the course. The whole idea is to learn the peculiarities of each type.

Gun Turret Course

In addition to the courses on the specific airframes, there is also one for electricians on the electrical circuits of the aircraft, and another, for armourers, dealing with the power-driven Bristol gun turrets.

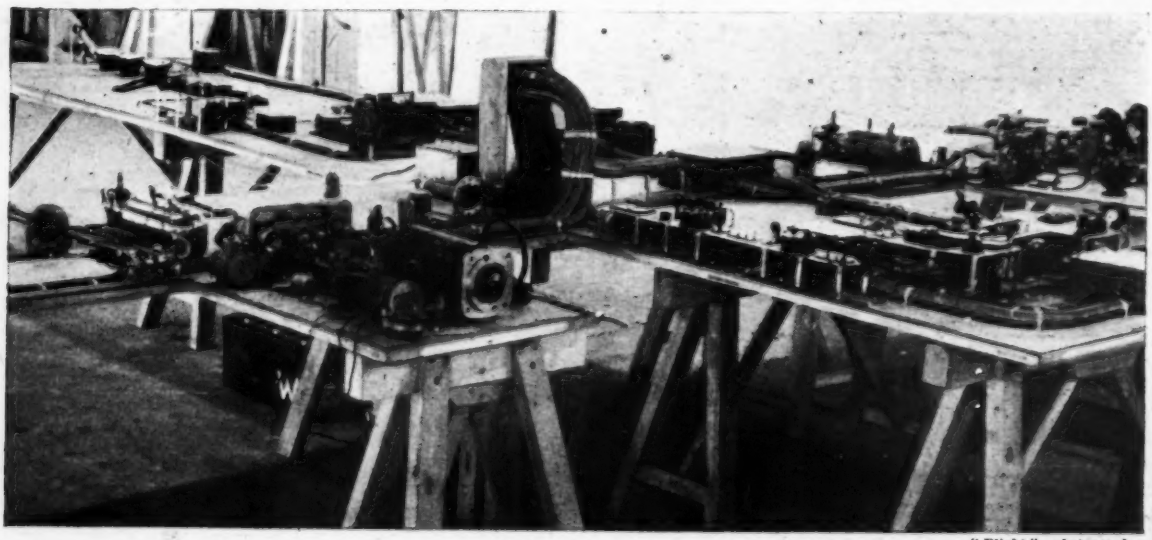
Instruction is carried out in accordance with syllabuses which have been prepared by the Bristol company and approved by the authorities of Training Command. The instructors are mostly civilians, drawn from the service department of the company which, of course, is always in close touch with the R.A.F. In fact, many of these instructors have served for long periods with the Royal Air Force. One or two of the instructors are non-commissioned officers of the R.A.F.

Since these pupils come from operational stations employing Bristol aircraft, they are invited to discuss any of the maintenance and repair problems which have come their way. In this respect the course takes on rather more of the nature of a conference because, if the points raised are of sufficient moment and urgency, a report goes immediately to the appropriate department whose job it is then to supply the answer and see that the information is passed to other units employing the same type of airframe.

Carefulness is the keynote. To obviate even the possi-

"Flight" photograph.

N.C.O.s and airmen with their instructor round a Beaufighter fuselage.



"Flight" photograph.

The special layout for the electricians' course with all the electrical components and wiring in the relative positions occupied when on an actual aircraft.

BRISTOL AIRFRAME SCHOOL

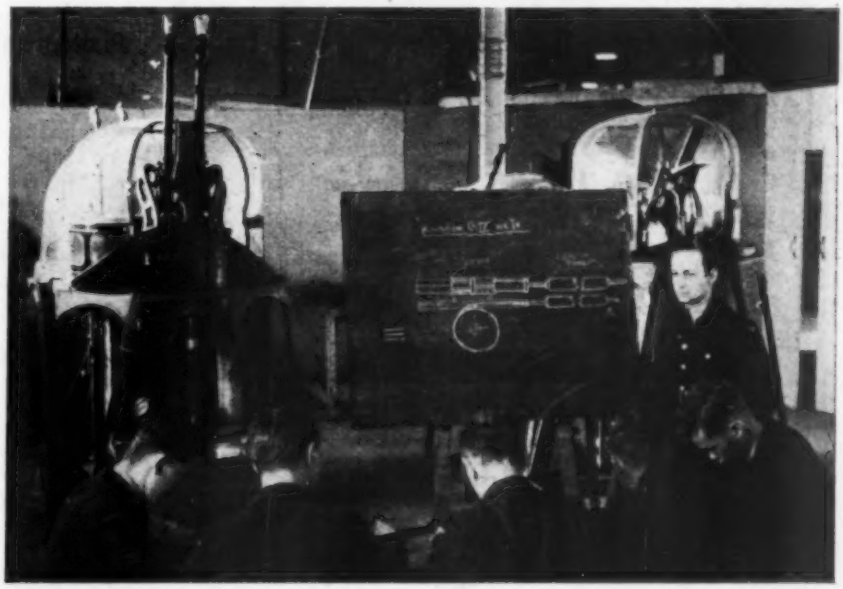
bility of mistakes occurring in notes being taken at lectures. Bristols give each pupil a very comprehensive set of lecture notes which incorporate all the subjects dealt with during the course, and which form a very useful supplement to any standard instruction manual issued by the Services.

The lecture rooms are well lit and comfortable, and a well-equipped hangar houses one model of each type of aircraft. These are complete—with the exception of the engines—and have all the working parts functioning, as well as being completely wired-up electrically.

In the lecture notes previously mentioned, there are included simplified diagrams of the hydraulic, pneumatic and electrical systems. These are reproduced in the school as working panels with the individual components in place. These, in turn, are supplemented by sectioned components. For the electricians there is a full-scale layout of all the wiring and components in the plan form of an actual machine. The whole idea is to give a clear picture of one complete system divorced from the complication of the other systems.

The turret course covers the construction, operation and maintenance of the power-operated Bristol turrets which were first fitted to the short-nosed pre-war Blenheims.

As in the other airframe instruction courses, diagrams and sectioned components are employed to illustrate the functioning of the various parts. Fluid circuits are available for demonstration, and practice adjustments can be made on the working turrets, of which there are a number of different types in the schoolroom. Assembling and dismantling is carried out with the installation in the aircraft. At the end of each course an examination is held and proficiency certificates issued.



"Flight" photograph.

An R.A.F. Sergeant-instructor takes the gun turret class. In the background are the Bristol power-operated working turrets used for familiarising students with operation and maintenance.

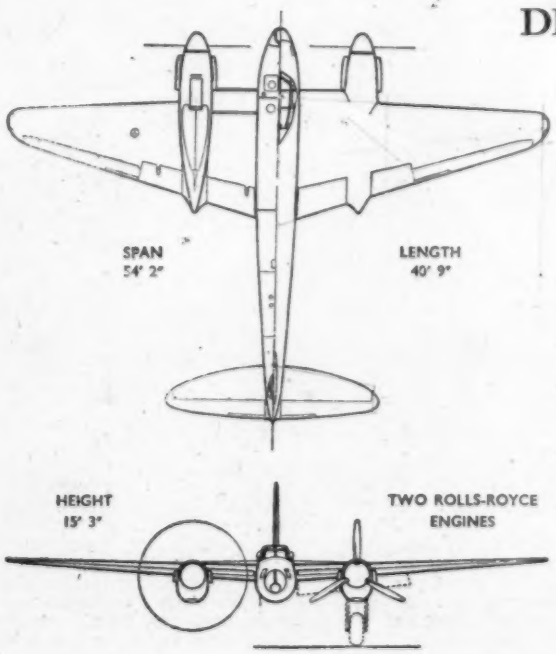
DE HAVILLAND MOSQUITO

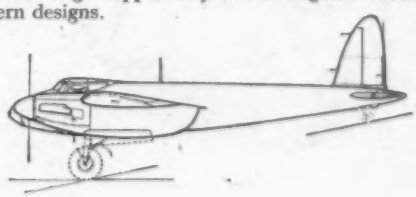
GENERAL ARRANGEMENT

SUPPLEMENTING the various photographs and sketches of the Mosquito published in previous issues, we give herewith the three-view general arrangement drawings of this extremely interesting aircraft type. In some ways they bring out even better than do the photographs certain features of the design.

The plan form, it will be observed, shows a very pronounced taper, reminiscent of the Comet which won the England-Australia race in 1934. The fact that the greatest taper is on the trailing edge is somewhat disguised by the greater chord of the centre section, the leading edge of which contains the radiators. The size, shape and location of flaps and ailerons are also well brought out. The good streamline form of the fuselage should be noted. Tailplane and elevator are typically D.H.

The plan and side views show clearly the way in which the tails of the engine nacelles project aft of the trailing edge of the wing. Apparently this arrangement is favoured in modern designs.



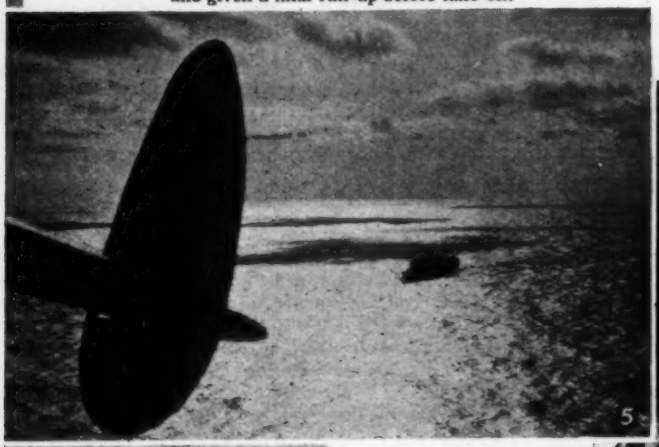


D

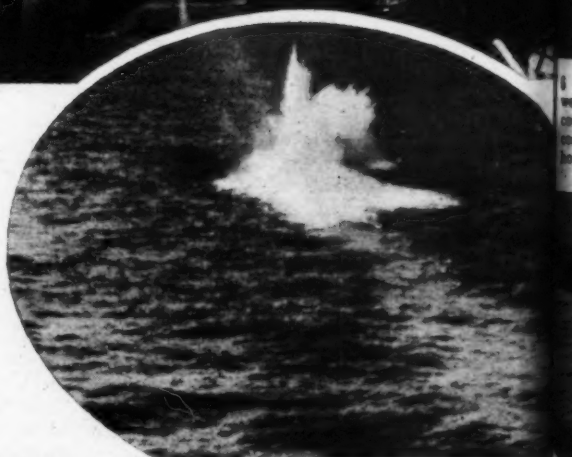
Q FOR

Photographs from a Cameraman's

1 In the Operations room at a Coastal Command station in Northern Ireland, the Hudson's crew get their instructions from the Intelligence Officer.
2 Crew, bombs, fuel and food aboard, the engines are started and given a final run-up before take-off.



5 An unescorted liner is passed on the way. The ship's superior speed and zig-zag course suffices to protect it from U-boat attentions.



9 A sudden panic crash-dive is made by the submarine as the crew spot the protecting aircraft. The Hudson is so close that the photographer is able to get a picture as the submarine slides under the surface.

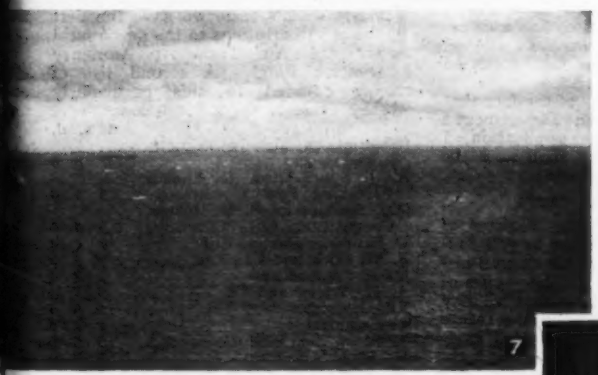
10 B for Bertie makes the first attack. The conning tower can only be a few inches under the water before the first bomb explodes. Queenie then makes her first run-up.

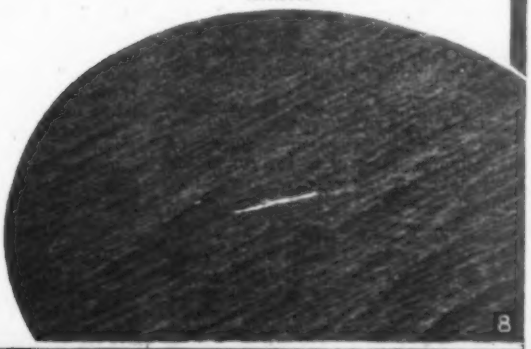
QUEENIE

a Coastal Command Hudson on Convoy Patrol

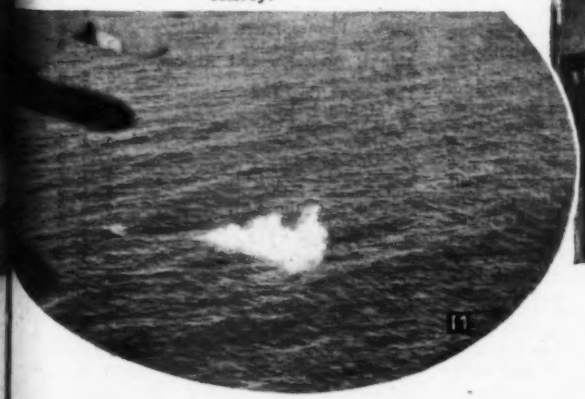
Q for Queenie keeps company with B for Bertie who has had an enemy submarine reported to him. Through scattered clouds the two Hudsons hurry to the attack.

4 Queenie's navigator "talks" to Bertie by Aldis lamp in order to preserve radio silence.





6 Out over the Atlantic, Mae Wests are regulation wear with parachute close at hand. A cup of hot coffee from vacuum flasks is passed round. 7 The convoy comes in sight as a cluster of dots on the horizon. 8 The U-boat is sighted making for the convoy.



11 As the attack is made a smoke float is dropped to mark the spot where the U-boat was last seen. Signals are made to surface vessels which will come to the area and carry on the attack. 12 Back at the station an account of all the excitement is passed on to the Intelligence Officer, and another patrol is completed.

IN PARLIAMENT

Sir Roy Fedden's Staff : American Dive-bombers : The Big Three : A.T.A. Status Under Review : Release from the R.A.F. : Civil Aircraft Design

Sir Roy Fedden

In a written reply to *Mr. A. Edwards*, *Sir Stafford Cripps* said that Sir Roy Fedden was leaving for America very shortly. He would be accompanied by a staff of ten.

Dive-bombers

Sir Stafford Cripps informed *Mr. Purbrick* that dive-bombers were not being produced in this country, but the requirements for this type of aircraft were being met from American production.

Air Training Corps

Mr. Perkins asked the Secretary of State for Air what percentage of aircrew personnel that have joined the Royal Air Force in the last six months have been members of the Air Training Corps?

Sir A. Sinclair: Of the volunteers for aircrew duties attested from May to October, 1942, 35 per cent. were members of the Air Training Corps.

Air Rank in R.A.F.V.R.

Mr. Purbrick asked the Secretary of State for Air whether an officer of the Volunteer Reserve of the Royal Air Force can attain Air Rank in any branch of the air service when such is available and for which he is qualified by merit.

The Secretary of State for Air (Sir Archibald Sinclair): Yes, Sir.

Mr. Purbrick: How many officers of the Volunteer Reserve in the Royal Air Force have Air Rank?

Sir A. Sinclair: Three.

A.T.C. Greatcoats

Sir Smedley Crooke asked the Secretary of State for Air whether he is aware of the growing feeling of disappointment felt by the boys in the Birmingham area of the Air Training Corps at the non-issue of overcoats; and will he consider the advisability of issuing overcoats in some other colour if the cause of the non-issue is the scarcity of blue cloth?

Sir A. Sinclair: It is well understood in the Air Training Corps that the issue of overcoats is precluded by the shortage of material, and I am informed by my right hon. Friend the Minister of Production that he is not hopeful that the difficulty can be overcome. The shortage is not restricted to blue cloth.

Air Transport Auxiliary

Mr. R. Morgan asked the Minister of Aircraft Production whether, having regard to the services rendered by the Air Transport Auxiliary Corps, he will consider recommending that it shall in the future be known as the Royal Air Transport Auxiliary Corps and that the pilots serving in it shall use the royal crown over the wings worn by them as in the case of pilots in the Royal Air Force?

The Minister of Aircraft Production (Sir Stafford Cripps): I am fully conscious of the excellent work which the Air Transport Auxiliary is doing, and I am already engaged in reviewing the status of the organisation. Judging, however, by the customary standards which apply to cases of this sort, I do not consider that I should be justified in adopting the course suggested by my hon. Friend.

Compassionate Release

Mr. Granville asked the Secretary of State for Air whether the discretion to accept or reject application for compassionate release rests with commanding officers or the Air Ministry.

Capt. Balfour: Authority to grant compassionate release rests solely with the Air Council, but a commanding officer may reject an application if he considers that the grounds do not warrant a recommendation to higher authority. If an airman feels himself aggrieved by the action of his commanding officer in rejecting his application, he has the right of appeal to the Air Officer Commanding under Section 43 of the Air Force Act.

Mr. Granville: Has the right hon. and gallant Gentleman now traced the application to which I referred his Department a few weeks ago?

Capt. Balfour: If the hon. Member means the case which he raised recently by Question and on the Adjournment, I have found that at no time has this airman applied for his release from service in the R.A.F. At no time has application been made for permanent release. If he makes one, it will be considered fairly and reasonably.

Mr. Granville: In view of the fact that I have a copy of the Department's acknowledgment of this application, I beg to give notice that I shall raise the matter on the Adjournment.

Transport Aircraft

Mr. Granville asked the Minister of Aircraft Production whether he will consider setting up a committee of civil aircraft designers to work on new types of transport machines in order that we may be able to take our place in the future development of international civil aviation.

The Parliamentary Secretary to the Ministry of Aircraft Production (Mr. Ben Smith): I cannot add to the reply made on September 30th to a question by my hon. and gallant Friend the Member for Coventry (Capt. Strickland) that, while the Government intend to deal with this matter at the appropriate time, the work of aircraft designers must, at the present stage of the war, be devoted wholly to war requirements.

Mr. Granville: In view of the long time it takes to produce a civilian prototype, and in view of the fact that other countries have designs on the drawing board, does the hon. Gentleman not think it time that the Department used men like Sir Roy Fedden to produce civilian prototypes for after the war?

Mr. Smith: Sir Roy Fedden is, of course, occupied in another country on behalf of the Ministry of Aircraft Production at this moment. He is an engine designer, and not an aircraft designer.

Mr. Montague: Is the Department aware of the tremendous strides made by both the United States and Russia in respect of transport planes.

Mr. Smith: My Department is fully aware of the strides made by those two countries; and, while we have at the moment no civil aircraft designers, as such, it is the intention of my Department to look into the matter at an early date.

Mr. Stokes: Is my hon. Friend aware that our American friends are continuing the development of transport aircraft, and is it not a fact that they will have a virtual monopoly at the end of the war?

Mr. Smith: My Department is looking into the question of utilising some of the excellent bomber types for our own civilian use.

Mr. Stokes: They are no use.

Mr. Smith: My Department must be the judge of that.

Mr. Granville: I beg to give notice that, owing to the unsatisfactory answer, I will raise the matter on the Adjournment at the earliest opportunity.

A.T.A.

BENEVOLENT FUND

IN last week's issue we gave the first list of subscriptions to the new appeal for the Air Transport Auxiliary Benevolent Fund. A second list of money donated to this particularly worthy cause is appended below.

	£	s.	d.
Subscriptions already acknowledged	2,747	8	0
A. J. Spurll, Esq. (of Bristol "Evening Post")	5	5	0
Maj. Searight (of H. M. Hobson Components, Ltd., Coventry)	5	5	0
D. Saunders Davies, Esq.	1	0	0
F. W. Cook and Co., Ltd.	5	5	0
Metal Components	2	2	0
A. M. Young and Co.	5	5	0
Elfson, Ltd.	5	5	0
Cox and Co.	2	2	0
J. Shaw, Son and Greenhalgh	5	5	0
H. Hipkiss and Co.	5	0	0
Westwood, Dawes and Co., Ltd.	2	2	0
Taylorcraft Aeroplanes (England), Ltd.	5	5	0
Mallock Armstrong Ear Defender Co.	5	5	0
County Commercial Cars, Ltd.	3	3	0
Wingrove and Rogers, Ltd.	5	5	0
Grice and Young, Ltd.	5	5	0
"Diamond H" Switches, Ltd.	5	5	0
Brailey Electroplaters, Ltd.	1	0	0
Gilchrist Bros., Ltd.	5	5	0
Abbott, Anderson and Abbott, Ltd.	5	5	0
The Rover Co., Ltd.	20	10	0
W. Mumford, Ltd.	2	2	0
W. Watson and Co. (Liverpool), Ltd.	2	2	0
R.F.D. Co., Ltd.	10	10	0
Everett and Co., Ltd.	1	1	0
Shrager Bros., Ltd.	5	5	0
R. and A. Main, Ltd.	10	0	0
James Walker and Co., Ltd.	10	10	0
Braid Brothers, Ltd.	2	2	0
A. A. Jones and Shipman, Ltd.	5	5	0
Western Airways, Ltd.	5	5	0
Crawford and Co., Ltd.	1	1	0
John Hill and Sons (Wolverhampton), Ltd.	5	5	0
Serco, Ltd.	2	2	0
Total	£2,915	2	0

Topics of the Day

MEMORY versus MECHANICS

The Need for Some "Anti-Worry" System in Modern Types : More Simplification by Complication : Noises Off : Real Propaganda

A VERY long time ago I remember seeing a photograph of a provisional mock-up layout for an American transport, in which a memory-jogging series of lights or tabs had been arranged in the control cabin. Memory, at best, is a poor thing except when it is dealing with abstract generalities or personal adventures, but I think the aircraft in question was the Curtiss-Wright 20 (now a troop-carrier or transport), and I believe the tabs, lights, or whatever they were, were automatic in operation. In other words, the symbols, lights, or whatever they were, changed colour or went out or moved as the various drill jobs were done for the take-off, or for the approach to land.

After this provisional admission that the idea is by no means new, I will endeavour to expand on it to my own specification. There will be an immediate uproar, of course: "Surely to goodness aircraft are already sufficiently complicated in their electrical layout—*must* we add more wires and more lights?" My answer is that aircraft are so very complicated already that a few more wires, lights and what not will make very little difference, and that I am really endeavouring to simplify by complication.

"Forget-me-Nots"....

Anyone who has flown a modern multi-engined aircraft will agree that, at least when single-handed, the "drill" business, both on the ground and in the air, is sufficiently involved to give any weak-minded person a nervous breakdown. In the middle of all the business of taxying a large machine down a series of complicated runways, the pilot sits there going through a long list of things to be done. And even when he has done them all to the best of his ability, he opens the throttles with a faint but horrid feeling that he may still have forgotten something—because different aircraft have different variations of take-off drill.

We have tried memory checks, and we have tried visual checks—each is all right in its way, but neither is proof against error. So many odd things have had to be added to the originally devised memory checks that they are becoming almost useless, and in the average aircraft the question of space has meant that items are spread all over the place, and no visual check can ever be very reliable. Furthermore, different aircraft have a different series of "extras." I always admire the civil test pilots of the old school who have devised their own checks of airframe, fuel and engine items; they never appear to be very worried about it all.

My idea, for what it is worth, is to have a series of labelled red lights with a three-position master control switch. When preparing for a take-off, you turn the switch to the position marked "Take-off," and the appropriate lights come up. As the various essential jobs are done—hydraulic power "on," trim set, mixture "rich," pitch "fine," flaps 20 degrees down, gills closed, fuel boosters "on," and tailwheel locked, for instance—the lights go out one by one. When they're all out, the master control switch is turned to "Climb," and the series of lights then cover the various essential jobs to be done after the aircraft has left the ground. Finally, when making a circuit of the destination airfield, the control is turned to "Landing," and the same process is repeated.

Breathless as I am, at the moment, after being chased by electricians from my typewriter to the nearest dugout or police station, I am unable to explain quite how all the connections are going to be made and how the micro-switches are going to be arranged to indicate one kind of red light for one particular part of an operation, and yet another for a further part of the same operation. But these same electricians never seem to be defeated when they are asked to provide a couple of dozen kinds of indication for more important jobs, so I have no doubt that such a system *could* be arranged if anyone thought that the saving in nervous breakdowns and crashes would be worth the effort, material, time and skill in designing and producing such a memory-jogging device. Needless to say, the whole system would need to be built into an aircraft during the mock-up and provisional planning period.

.... or a "Shopping Card"

No? Well, what about a tab system on the lines of the thing that used to be provided for harassed housewives to aid them in their shopping plans? You know the idea; as various items in the commissariat begin to show signs of running out, tabs are turned over so that these items are not forgotten on the next trip to the shops. Such memory signals are hardly necessary to the housewife to-day, so why not apply the same system to help the harassed pilot? The electricians are screaming for my blood outside the police station, so I had better describe this alternative system.

Within the pilot's view are a series of these labelled tabs covering every possible operation in every type of aircraft. The board for, say, the Sutton Coldfield "Splendiferous" six-engined night bomber ("Travels 8,000 miles with 40 tons of bombs at 300 m.p.h.") would have the master control arranged so that, on turning the handle to "Take-off," the requisite items would appear like the discs in the old-fashioned door-bell indicator..

When the jobs had been done—at *least* two dozen on the "Splendiferous"—all the tabs would have been turned and the board would be "clean" until the handle is turned to "Climb," when all kinds of new and interesting jobs would be put up for attention. Maybe a bell or horn could ring or blow continuously until each series of checks had been registered—though that would possibly be productive of more nervous breakdowns than the concentration that my device is intended to supersede. Heaven knows that the majority of undercarriage horns are sufficiently nerve-racking without the addition of further cacophonies.

Automatic Operation ?

At the back of my mind is the fear that a continuous series of noises and red lights will be more than the poor pilot can bear. He already has quite a sufficient number of lights and indications. Perhaps we'd better go *all* the way, and ask the electricians to produce a series of devices which, on turning the aforementioned master knob, will actually *do* all the work for the pilot, who then sets his automatic pilot and goes back to his bunk amidships.

For no particular reason, the idea of complication on complication reminds me of the B.B.C. news bulletin, which, in much the same way, has succeeded in defeating its own object—an object only partially re-achieved by the introduction of an initial summary. Which is about all that anybody listens to unless the news (as it was during the initial stages of the North African attack) is sufficiently new and exciting. Unfortunately, items of interest are occasionally plugged in near the end of the news, and the poor listener must continue to listen through acres of words and more words in that peculiar tone of voice designed by B.B.C. announcers.

Even if we overlook the long-winded additions about Little Willy of Tooting Bec, who saved fourpence ha'penny for the Government by the ingenious means of making

MEMORY versus MECHANICS

aspidistra bowls out of old fountain pens and selling them for three-farthings each, or how Mrs. Stickleback of Notting Hill collected four shillings and sixpence in ten days, thus creating a new record high for collectors over the age of a hundred and five—and that sort of thing takes a good deal of overlooking—the news has never seemed to me to be very "professional" propaganda. Too many words are used for unimportant items, so that there is no value in anything, and no snap when events which really matter are well described. It just goes on and on, and nobody listens.

Although the English, as a race, can laugh at "propaganda" and treat it as an unnecessary device for bolstering up morale in hag-ridden Axis domains—it is important nowadays. Not, perhaps, propaganda as such—the very word suggests the use of lies or half-truths to give people false courage—but hard, tough, vigorous stuff with a masculine, virile touch.

When we're driven back or held up, let us say so, and add a few sentences to describe the courageous work at various points in the defence line. Just as the Navy never received its full due for epics like the *Rawalpindi* and *Jervis Bay*, when men sailed into almost certain death, or for their work in evacuating Dunkirk or Crete, so the Army has never been given the credit for courageous stands and attacks. It is always the Americans or the Canadians or the Australians who are mentioned, never the Cockneys or the Scots or the Yorkshiremen who do the donkey work and die without a word. The Air Force fellows can't grumble; they had their fair share of publicity after the Battle of Britain.

As I say, we don't want propaganda in its modern meaning; we want good, hard facts, with a touch of glory to make the people who do the real work feel that it is all very well worth while and that they are no longer struggling along in a "phoney" war. INDICATOR.

CATAFIGHTER'S ARCTIC SUCCESS

Bags Two Heinkel Topedo-planes and Just Reaches Russian Airfield

WITH only five gallons of petrol in his reserve tank enough for about a seven-minute flight—a Hurricane Catafighter pilot landed in Russia after shooting down two German bombers and then flying over Arctic sea and North Russia in a determined effort to save his aircraft.

The pilot, F/O. A. H. Burr, member of the Merchant Ship Fighter Unit, had fought the German bombers over an Allied convoy which, although heavily attacked, won its way through to a Soviet port with vital war materials. Since F/O. Burr is now back in this country, the full story of his combat can be told.

"We had already been attacked by two waves of enemy aircraft before I was catapulted from my ship," he said. "During one of these attacks, my launching crew had to repair the installations. They went calmly about their work with bombs falling all round the ship.

"Then a formation of torpedo-carrying aircraft was reported as coming in to attack and I was catapulted off to intercept them. I had to swerve violently to avoid the balloon cables of other ships, but I got clear and climbed to about 700 feet.

"I looked over the side and saw 15 He 111s coming in line abreast. They were about three miles behind the convoy and only 50 feet above the water. I dived on them and attacked head-on. Picking out one of the bombers, I made two quick attacks and smoke poured from both the enemy aircraft's engines. Then I broke away so that I should not hamper the ship's gunners, who were firing at the other Heinkels. As I passed ahead of the convoy I saw, still floating on the water, the wreckage of the bomber I had attacked.

"None of our ships was hit by the Heinkel's torpedoes.

"I then patrolled to the starboard of the convoy, for although I had no ammunition left I meant to try to break up any other formations by mock attacks. But no enemy aircraft appeared, though bombs were being dropped through the clouds. I now checked my petrol, and finding that I had 70 gallons left I radioed my ship to find out how far it was to the nearest land. I was told the distance. I decided to do my best to save my Hurricane, so I set course for Russia.

"After fifteen minutes' flying I ran into a fog bank about 40 miles wide, but eventually I made landfall and pinpointed my position. I landed with only five gallons in my reserve tank.

"When the convoy reached port I had the good news that my attack had brought down a second Heinkel. The captains of two of the ships told me that when I made my head-on attack they saw a Heinkel swerve out of formation and, in attempting a tight turn near sea level, crash into the water."

Merchant Gunners' 228 Hits

GUNNERS in Defensively Equipped Ships have destroyed or damaged 228 enemy aircraft since the beginning of the war.

This is the score of men of the Navy's D.E.M.S. Service and the Maritime Regiment. It is made up of 88 aircraft confirmed as destroyed, 42 probables and 98 damaged, and this is on a very strict basis of assessment.

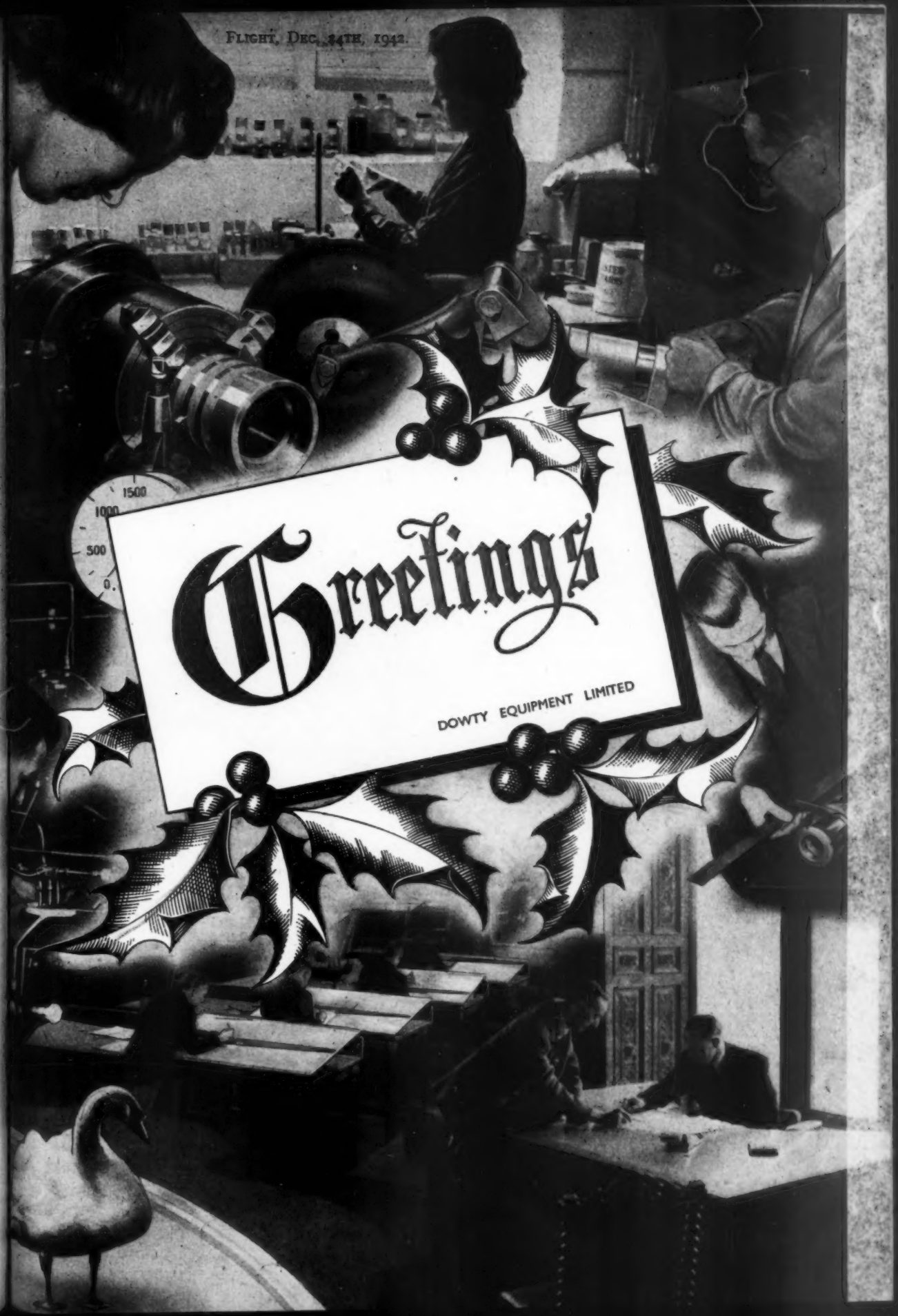
Few branches of the Royal Navy have grown in such size, scope and importance during the war as the D.E.M.S. Service. At the beginning there were only 1,300 men available for this vital Service, and they were mainly naval and marine pensioners. In defence of the merchant ships they were assisted by their colleagues of the Merchant Navy, whom they helped to train.

In the first year of war the demand for high-angle anti-aircraft guns was so great that there were few to spare for merchant ships. Even low-angle guns were short in supply. Most of them dated from the last war or before. In many cases D.E.M.S. gunners sailed with Lewis guns as their main armament.

Now the D.E.M.S. Service is a regular branch of the Royal Navy, and numbers nearly 20,000 trained seamen gunners and gunlayers, augmented by thousands of Army gunners of the Maritime Regiment. Men joining the Navy are drafted to D.E.M.S. Service just as to any other branch of the Navy.

Merchant ships, both British and Allied, are now equipped with a great variety of new weapons and anti-aircraft devices, so that a D.E.M.S. rating may be called upon to run any of eighteen different kinds of weapons, from a six-inch gun to a little Marlin machine-gun which fires .30 ammunition.

The Naval gunnery crew in a merchant ship may now number anything from five to 25 or even more in exceptional cases. It takes four months to train a D.E.M.S. seaman gunner, and one Northern training establishment alone turns out 100 men a week.


Greetings
DOWTY EQUIPMENT LIMITED

Twenty-eighth of the New Recognition Series

AIRCRAFT TYPES AND H

CANT Z 1007 bis "ALCIONE"

"KINGFISHER" seems to be a popular name for aircraft, whatever their type, for that is the English interpretation of "Alcione," the name given by the Italians to the Cant Z.1007*bis* which is one of their very best bombers. It was designed by M. Zappata, who was responsible for the Bleriot 110 monoplane which put up a long-distance world's record ten years ago by flying 6,703.5 miles non-stop over a closed circuit.

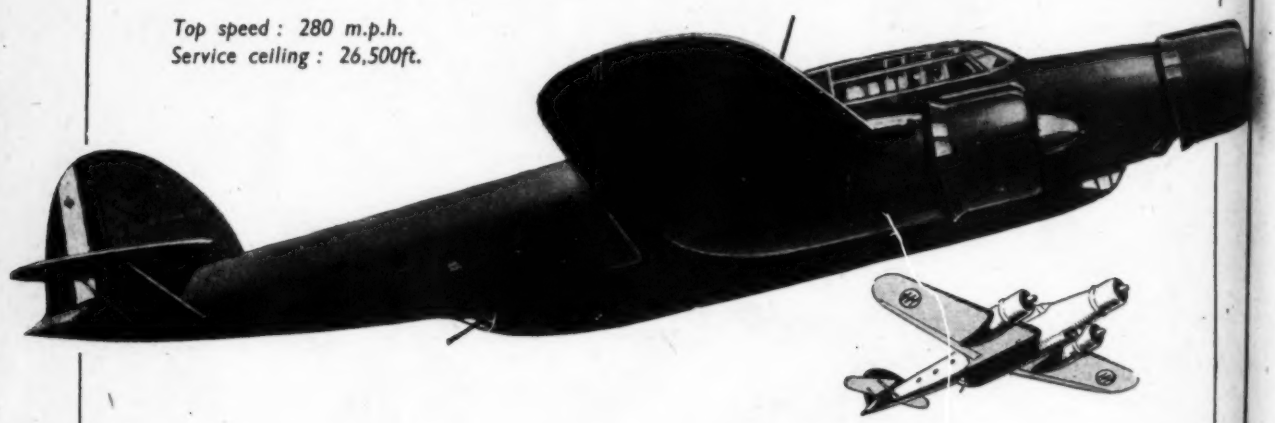
Powered by three Piaggio P.XI. R.C.40 air-cooled radial engines, the "Alcione" is really a landplane version of the well-known Z.506B "Airone" floatplane but with more powerful engines and a longer nose. "Airone," incidentally, means "Heron."

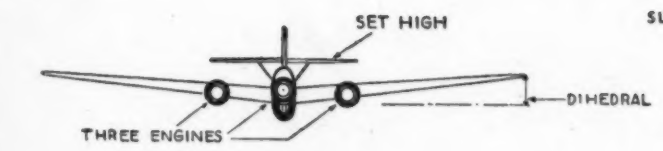
With a total of 3,000 h.p. provided by its three engines, the Alcione has a top speed of 280 m.p.h. and a normal operating speed of 245 m.p.h. at 15,000ft. Its range at the lower cruising speed is 800 miles, and its service ceiling 26,500ft. It has largely replaced the older Savoia Marchetti SM-79 heavy bombers of the *Regia Aeronautica* and, having been used in every theatre of war in which Italy has been engaged, may be described as one of the mainstays of her bomber strength—if "strength" is the right word?

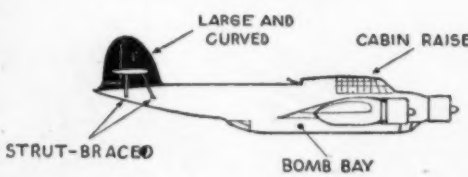
Actually there is another version of the Alcione which has Isotta-Fraschini water-cooled engines with car-type radiators, but the radial-engined edition illustrated here is the one chiefly in service with the heavy bomber squadrons. A still later version of the Alcione, the Z1007*ter*, differs in having a dihedral angle to its tailplane which carries twin fins and rudders in place of the large single unit of the *bis*.

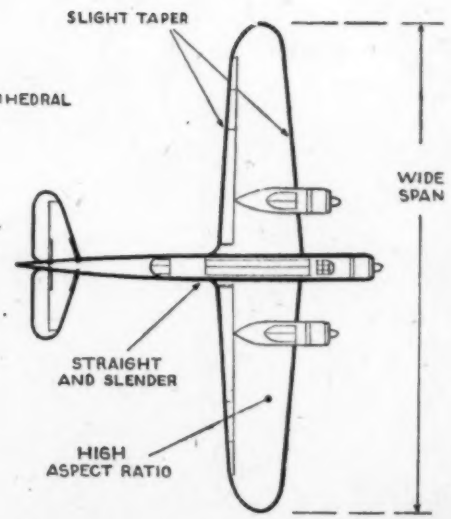
Constructed of what has now become known as "non-strategic" materials, the Alcione is built of wood and has a plywood skin; in the case of the wings, this plywood skin has a final covering of fabric. The fuselage is of the semi-monocoque type, while the cantilever mid-wing employs two box spars for its main structure. Armament of the 1007*bis* is limited to two 0.5in. m.g.s, one in an open position behind the raised cabin, and another at the rear of the bomb bay, but the 1007*ter* has, in certain cases, a gun-turret above the fuselage.

Top speed: 280 m.p.h.
Service ceiling: 26,500ft.







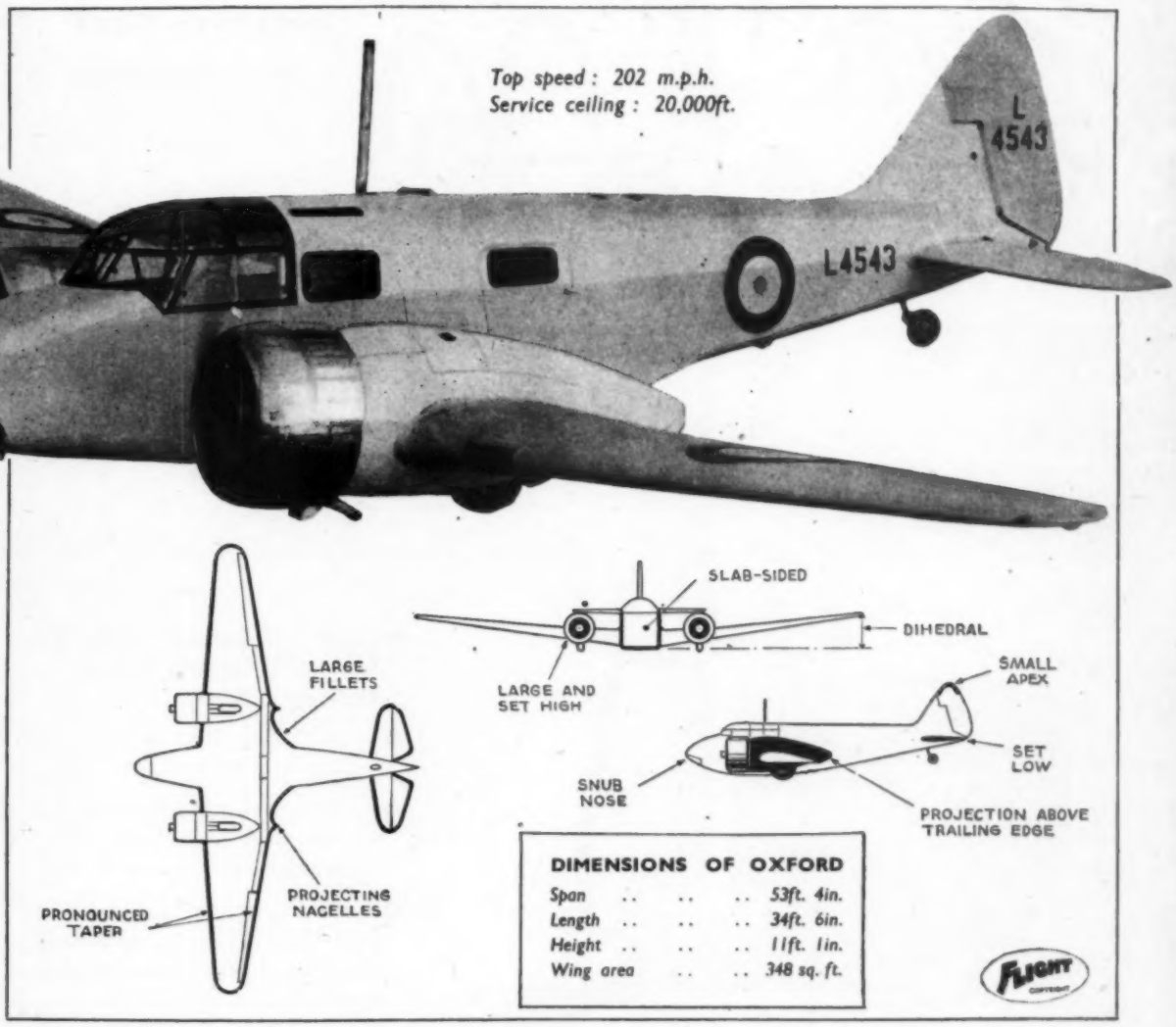


DIMENSIONS OF THE "ALCIONE"

Span	81ft. 4in.
Length	60ft. 4in.
Height	17ft. 0in.
Wing area	936 sq. ft.

HEIR CHARACTERISTICS

AIRSPEED OXFORD



DIMENSIONS OF OXFORD	
Span	53ft. 4in.
Length	34ft. 6in.
Height	11ft. 1in.
Wing area	348 sq. ft.

ALTHOUGH it receives little publicity, the Airspeed Oxford has been giving excellent service for a number of years, and proof of its value as an advanced training type is given by the fact that it is in use not only in Great Britain but in Canada, Rhodesia, Australia and New Zealand. In the Middle East it is employed as an ambulance.

It was originally designed and built to an Air Ministry specification in 1937, when it was fitted with Cheetah X engines and a dorsal gun-turret amidships. The Oxford II disposed of the gun turret and the Oxford III had Cheetah XV engines. Then came the Oxford IV with dé Havilland Gipsy engines, but only one experimental model of this type has so far been built.

The Oxford V is equipped with two nine-cylinder Pratt and Whitney Wasp Junior R-985-AN6 air-cooled, radial engines each of 450 h.p., and its performance has thus been usefully improved.

Actually the Oxford was a development of the Airspeed Envoy light transport of 1935, the major changes to the fuselage being an increase in width to accommodate side-by-side seating and a modified nose permitting the provision of a bomb-aimer's position right forward. Although intended from its inception purely as an advanced twin-engined trainer, the Oxford has been employed operationally as a light bomber in New Zealand since "Pearl Harbour" and, as such, carries two 250 lb. bombs.

Learner-spotters will probably see in it a fairly close resemblance to the Anson from certain angles, but closer study will soon disclose the essential differences, especially the comparatively high-aspect-ratio wing plan and the way in which the engine nacelles project above the trailing-edge of the wings.

Of wooden construction, the wings are built up of two box spars of spruce and birch three-ply. The whole wing is covered with three-ply and Handley Page slotted ailerons and split trailing-edge flaps are fitted. The fuselage is semi-monocoque and is built in two sections.

Although the crew would not normally exceed three at any one time, the accommodation can so be adjusted that provision is made for the training of pilot, bomb-aimer, navigator, wireless-operator, gunner and camera-operator.

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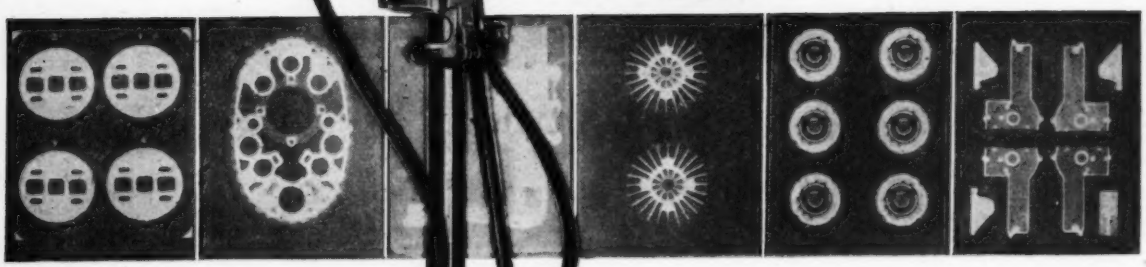

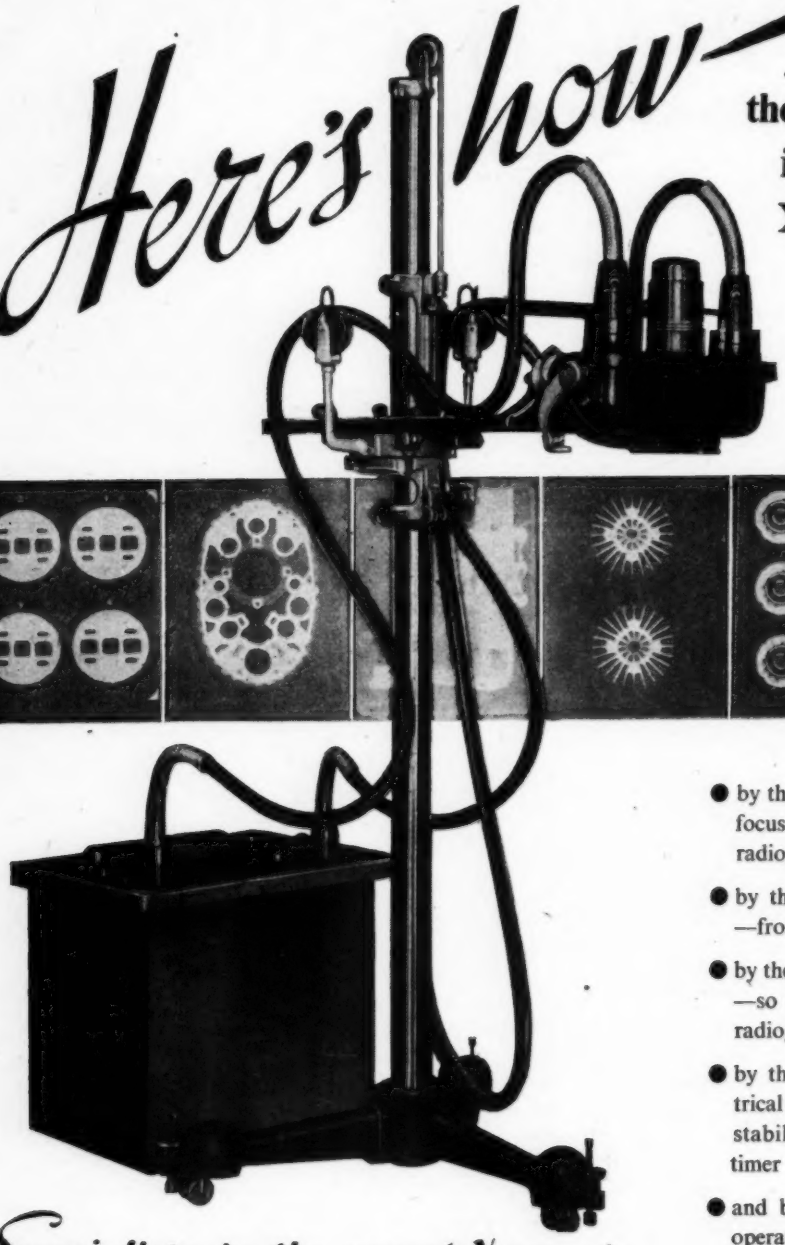

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BEHIND THE LINES

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Air Views

TO make school-children more familiar with aerial photography, air pictures have been introduced as a medium of instruction in all German schools. The familiarity with air pictures, it is said, will help towards a better understanding of reconnaissance work—a necessary achievement of every modern soldier.

Since the average German youth comes into contact with air photography only upon joining up, he has to overcome the initial setback of unfamiliar angles and perspective before being able to understand and to employ it usefully.

For this reason German teachers will now be given a special course, upon the completion of which they will act as instructors in their schools. It is not planned to instruct school-children in actual air photography, but to teach them to understand and interpret air views and generally to use air photographs in the teaching of such subjects as geography, local history, etc.

Another Rubber Source ?

IT is reported from Germany that in the Radom district of occupied Poland, a Brazilian plant similar to the African sisal was found growing wild. The plant, which appears to thrive on sandy soil and to be completely acclimatised to European conditions, is claimed by the Germans to contain two per cent. rubber, and has been called by them *Asclepias Cliensis*. It appears that even this meagre source of rubber is to augment Nazi rubber supplies.

From Spain

A NEW aluminium plant is to be constructed somewhere in Spain by the *Sociedad General Española del Aluminio S.A.* Local raw materials are to be used, and the plant is said to be planned for an annual production capacity of 2,000 tons, which is to be increased later to 10,000 tons.

Via Germany

ACCORDING to reports in the German Press, aircraft are being used in the U.S. for transportation of rubber. A service operating three times a week is said to be carrying supplies of wild rubber from the central parts of Colombia to the centres of the American industry.

Short Service

THE shortage of skilled labour, which is so acutely felt in Germany, is responsible for yet another innovation of the *Luftwaffe*. Mechanics and engineers are drafted into the *Luftwaffe's* service for short periods to help with urgent work. The extent to which the German air force suffers from lack of skilled maintenance personnel is best shown by reports in the German Press stating that some engineers are drafted from the industry for periods as short as three days.

It is obvious that if the *Luftwaffe* had any other source of man-power they would have relied on it in preference to the complicated drafting of temporary men from the industry.

ON THE RUSSIAN FRONT: A German observation balloon being hauled down to its lorry. These balloons are used for artillery spotting and are usually protected by an A.A. battery; note the finger patches which distribute the pull of the ropes.

A New Trainer

THE *Valtz Electrotechniska Fabrika* has produced a new trainer designed by K. Irbitis and designated the VEF.J.17. This is a low-wing cabin monoplane constructed in wood and composite material. It is to be used for training and aerobatics, and has a tandem seating arrangement.

The wings are in Latvian pine in three sections, covered with some composite material. To facilitate the production in series, the fuselage is composed of two sections. The undercarriage is fixed and can be replaced by skis. The aircraft can be alternatively powered either with a Walter Major or a Walter Pirate engine of fourteen cylinders and 138 h.p., or with a Hirt HM.56.

The all-up weight of the trainer is 1,960 lb., and of the aerobatic version 1,870 lb. Maximum speed is 145 m.p.h., landing speed 43 m.p.h., and it climbs to 6,000ft. in 12.5 min.

Relativity

ON the occasion of the fifth anniversary of the appearance of the B.F.109 at the International Flying Meeting at Zürich, the German press compares the qualities of this aircraft with its present descendant, the Me 109. It is stated that since then the speed of the Me 109 has improved by 50 per cent., and the time necessary for production has been reduced by 30 per cent.

Home Flak

R.A.F. raids on Germany have been responsible for the formation of a new kind of *flak* artillery, officially called by the Germans "Home A.A. Artillery" (*Heimatflak*). Industrial workers and members of the Hitler Youth have been drafted into this organisation, which is operating mainly in the western parts of Germany. In Hamburg, for instance, Home *Flak* men receive training in the evenings and have uniforms identical with the German Army.

To compensate them for their duties, an extra food ration is given to them, and it is stated that ex-Service men are paid according to their previous military grades.

French Glider

TEST flights of the first all-metal glider constructed in France are reported to have been completed at Air-sur-Adour. The glider, designed by D. Rastel and named SOP-I, is said to be specially suitable for aerobatics.

The SOP-I has an all-up weight of 700 lb. and is capable of a maximum speed of 43-47 m.p.h.

B.M.W.

A RESHUFFLING of the board of directors of the B.M.W. company is reported from Germany. Dr. Kurt Loehner, a director of the company, has left to take charge of the Institute of Combustion Engines at the Technical College of Braunschweig. Dr. Haspel, hitherto a manager of the Sindelfingen Works, has joined the board of the B.M.W. concern. Chairman of the board is Fritz Hille, and the other members are Erich Zipprich, director Max Weber, Fritz Fiedler, and Bruno Bruckmann.

Rumanian Mercury

IT is reported from Bucharest that the Rumanian Gold Mining Company, *Mica*, plans to begin the production of mercury. The daily capacity of the plant, which is to be established shortly, is estimated at 352 lb.

The process which the company proposes to employ is said to be based on the most recent researches, and the expected yield is about 8.8 lb. of mercury per ton of ore.

VAPOUR LOCK

Problems Encountered in Aircraft Fuel Systems During Rapid Ascent

By D. C. GREENWOOD, A.M.Inst.B.E.

DUE to the extremely rapid ascent of fighter-type aircraft, it is possible for trouble to be experienced from the increased rate of vaporisation, or even boiling, and consequent engine-cutting, owing to vapour locks forming in the fuel system under conditions of reduced pressure at high altitudes. The temperature of the fuel is insufficiently lowered below that of its ground-level value and causes the saturated vapour pressure of the fuel to be maintained at a relatively high value.

Saturated vapour pressure, or, as it is usually termed, vapour pressure, represents the pressure which the vapour of a liquid actually exerts (when the vapour is in contact with the liquid). All liquids to a greater or lesser extent give off a vapour, and certain experiments can be performed to measure this vapour pressure. The greater the volatility of the liquid the greater is its vapour pressure, for constant temperature. Now, when the V.P. of a liquid becomes equal to that of the atmosphere its rate of evaporation is greatly increased and the liquid boils.

Vapour Pressure Variations

The vapour pressure varies with temperature, being increased as the temperature rises. Hence, the vapour pressure of water becomes equal to that of the atmosphere (at sea level) at a temperature of 100 deg. C., and boiling occurs. If the atmospheric pressure were much reduced, as on a high mountain, the water would boil at a much lower temperature than 100 deg. C. This, of course, explains the phenomenon of the difficulty of making good tea or cooking an egg on a mountain top. At 25,000ft., for instance, water would boil at about 75 deg. C.

It is thus easy to see what effect rapid climb to high altitude has on the petrol in the tanks of an aircraft. With their bullet-proofing providing very excellent heat insulation, the temperature of the petrol remains relatively high. Fig. 1 shows the vapour pressure of petrol at different temperatures.

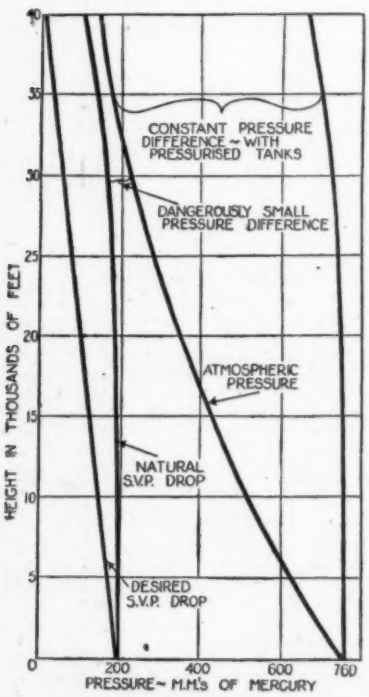


Fig. 2. Convergence of atmospheric and vapour pressures.

Two methods of preventing the coincidence of the fuel vapour pressure with atmospheric pressure are suggested, one being to increase the air pressure on the surface of the fuel by applying air pressure in the tank. The other is so to reduce the fuel temperature that the fuel V.P. will always be low enough to prevent boiling or excessive vaporisation occurring.

The application of pressure to the tanks seems to be the simplest method, but would not appear very satisfactory owing to the disadvantages entailed by the incorporation of an air compressor pump; among these are increase of weight; the disadvantages of additional apparatus; and the danger of pressurised fuel tanks in aerial combat.

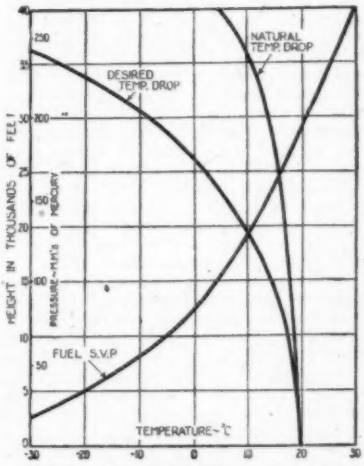


Fig. 1. Fuel saturated vapour pressure and temperature drop.

On the other hand, as the trouble is caused to a great extent by the fact that the temperature of the fuel does not fall quickly enough during ascent, it would seem that a more natural and satisfactory method of overcoming the trouble would be to reduce more rapidly the temperature of the fuel during ascent; or, indeed, if time allowed, in the tank while on the ground prior to operation, say, by the use of an efficient refrigerant such as solid carbon dioxide. (The author has performed private experiments on refrigeration lines, but, owing to the unavailability of petrol, water had to be used and results corrected. The results indicated that success in actual practice might be achieved, but, on the other hand, experimental errors might be large.) The design of the fuel system itself can contribute a great deal to curing the trouble.

Fuel Temperature on Climb

In actual flight there is some drop of fuel temperature with altitude, and in typical fighter-type aircraft the reduction in temperature is approximately 10 deg.-20 deg. C. from ground-level value for a climb to 35,000ft. But this is not sufficient, and the V.P. still remains comparatively high at altitude, even if it does not reach the atmospheric pressure at that altitude. Hence excessive vaporisation will always occur even if the fuel does not actually boil. Therefore a greater reduction of temperature must be achieved during the time taken by the aircraft to reach altitudes at which vapour locking trouble is manifest.

Fig. 1 shows a typical case of natural fuel temperature drop during a rapid climb to height. Fig. 2 shows atmospheric pressure up to 40,000ft., and also curves, obtained from Fig. 1, of the V.P. drop during the climb. It will be seen that the difference between atmospheric pressure and V.P. decreases greatly compared with the difference existing at ground level, or:—

at ground level:—

atmospheric pressure – V.P. = 560 mm. of mercury.

at 30,000ft.:—

atmospheric pressure – V.P. = 75 mm. of mercury.

From this it is apparent that vaporisation of fuel at 30,000ft. is greatly accelerated. Or, at 30,000ft., the condition of the fuel at that height could only be reproduced at ground level by heating the petrol to about 65 deg. C., only about 5 deg. C. below its boiling point. (Strictly speaking,

of course, there is no fixed boiling point for petrol; different types of petrol have different boiling points. But this illustrates the problem.) If the V.P. and atmospheric pressure curves in Fig. 2 had converged enough to touch, then boiling would actually occur.

Ideal conditions would be, of course, to keep this ground-level pressure difference constant at all heights. The only way of doing this is to apply pressure to the tanks. The chief virtue of this method is thus apparent. Fig. 2 illustrates such conditions.

If refrigeration were used, Fig. 1 shows a "desired temperature drop," and Fig. 2 the corresponding "desired vapour pressure drop." No criterion is known by which to judge what constitutes a safe value of pressure difference, and it would, of course, be impossible to produce a difference greater than about 140 mm. at 40,000ft., except with the pressure method.

In tropical countries the trouble can, of course, be much more serious, and all reports on the subject stress primarily that the cooling of the fuel should be the first consideration. Fuel pipes, so far as practicable, should also be kept well away from any source of heat from the engine.

Death of Air Vice-Marshal Maund

THE Royal Air Force and the British aircraft industry have learned with sincere regret of the death, on December 13th, of Air Vice-Marshal A. C. Maund, C.B., C.B.E., D.S.O. It was as commanding officer of the Aeroplane and Armament Experimental Establishment, Martlesham Heath, Suffolk (twice), that "Cissie" Maund, as he was inappropriately called, came in the closest contact with the aircraft industry, to test whose products Martlesham existed. He presided over that establishment in 1921 and 1934, and was in the habit of pleading with aircraft constructors for better teamwork between themselves, the engine manufacturers, the research establishments and the test pilots. At one of the Martlesham "Contractors' Dinners" he expressed the view that the 250 m.p.h. which we were then getting from our fighters was nothing like enough, and that we should aim at 300 m.p.h. at least.

Apart from his work at Martlesham, Arthur Clinton Maund had a distinguished service career in the Air Ministry and the R.A.F. Born in London in 1891, he enlisted as a private in 1914 in the Canadian Infantry. In 1915 he was gazetted, and the following year was attached to No. 8 Squadron in France. He served first as an observer and later became a pilot. During 1917-18 he was in command of an R.F.C. mission to Russia. 1919 found him at the Air Ministry, and during that and the following year he commanded yet another mission, this time R.A.F., to South Russia.

During the years 1920-24 he commanded the School of Army Co-operation, the Armament Experimental Establishment, and a squadron in India. On returning home he completed the course at the R.A.F. Staff College, going from there to the Air Ministry on technical staff duties. The outbreak of war found him at Headquarters, Middle East, and on his return to this country in 1941 he was posted to Headquarters, Technical Training Command. Air Vice-Marshal Maund combined with his great abilities a personal charm which won him innumerable friends in the Services and the industry. He will be greatly missed.

New Lisbon Air Port Director

LT. COL. CARLOS ESTEVES BEJA, of the Portuguese Military Air Force, has been appointed Director of the new Lisbon Air Port, and his assistant will be Senhor Carlos Eduardo Bleck, a civilian, and the best-known civil pilot of Portuguese nationality.

Lt. Col. Beja, who took an aeronautical engineering course in France, was for many years Director of the Aircraft and Engine Factory (*Oficinas Gerais de Material Aeronautico*) at Alverca. For years, also, he has been Secretary of the *Conselho Nacional do Ar*—the Government body controlling non-military aviation in Portugal.

He has also been for years Director of the Army Meteorological Services.

Constant-tension Control Cables

OPERATING cables of ailerons, rudder and elevator become too loose at times because of increase in atmospheric temperature or a temporary distortion of the aircraft in structure. Hence common practice has been to adjust the cables so tight that they will not become too loose to function satisfactorily under any normal conditions. The result is that the pilot must exert considerable effort to overcome friction of the cables in their angular guides and operate the control surfaces. Moreover, the life of the cables is shortened by the friction.

These assertions are made in the specification of a United States patent (No. 2,298,611), issued last October to Henry H. Bruderlin, of Hermosa Beach, California, and assigned by him to the Douglas Aircraft Co., of Santa Monica, in the same State. The patent discloses a device designed by the inventor for maintaining constant moderate tension on the cables and enabling the pilot to feel and evaluate flutter of control surfaces by his grasp on the control column.

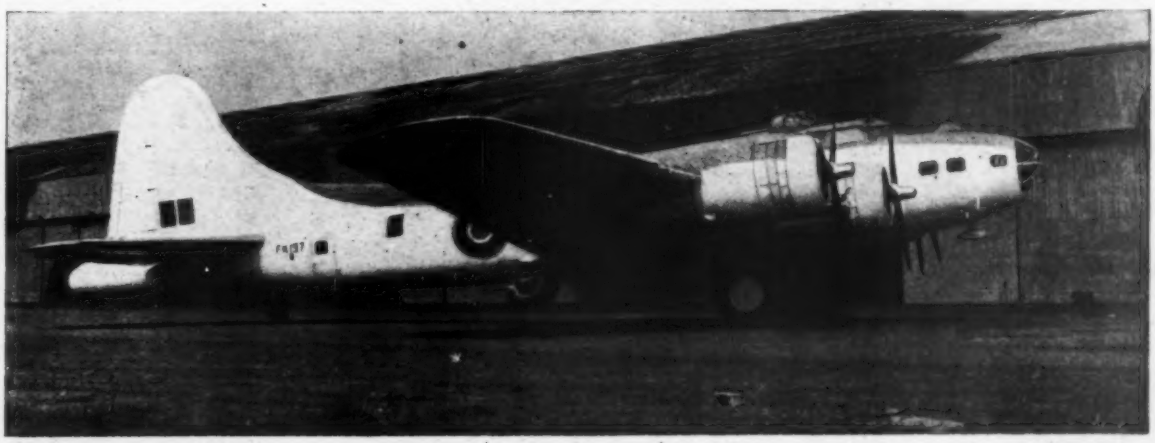
The invention consists of a coil spring connecting two ends of a divided cable to maintain constant equalised tension while the column is at rest, and means for preventing extension of the spring when a pull on the cable is exerted in either direction, the connection of the cable to the control surface, within which the device is housed, then being direct and positive.

Schoolboys' Junkers 88 for Salvage

BOYS of the County School, Minehead, Somerset, have given up their most treasured possession, a Junkers 88.

Over a year ago, this German machine was brought down in the West Country. Much of it was undamaged, and after examination by experts, and the removal of certain parts, the Air Ministry acceded to the request of the headmaster that the rest of the machine might be used to assist the school's two corps of the A.T.C.

Now the boys feel that the machine will serve its best purpose by going to make bombs or shells to bring down other German aircraft.



UNDER BRITAIN'S COLOURS. An up-to-date turreted Fortress bearing the roundels of the Royal Air Force. A number of Flying Fortresses are in service with Coastal Command, where their long-range capabilities are a great advantage on Atlantic patrols.

TRANSPORT AIRCRAFT

Part II.—Assisted Take-off or Refuelling in Flight of Long-range Types : The Question of Power Plants

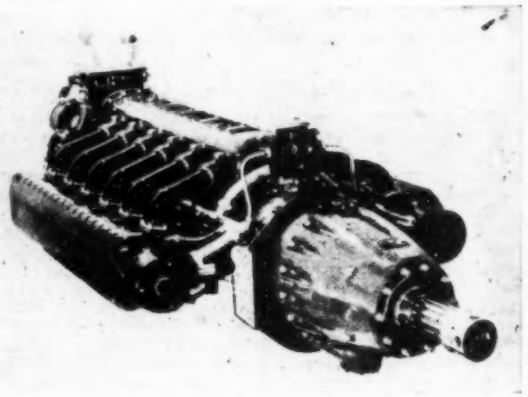
By W. NICHOLS, A.R.Ae.S.

THE tricycle undercarriage appears to be the ideal arrangement for the future land transport. Some of the advantages may be summed up as follows: An unobstructed view at all times for the pilots. Directional stability on the ground is good, and an aircraft can taxy on a curved path, thus making accelerated take-off possible. Manœuvring on the ground in confined spaces is made easier by this arrangement. Blind take-off is simplified, as the aircraft will always tend to run straight, and no critical adjustment of attitude is required during take-off. Brakes may be applied at the maximum power, and in night landings the slight variation in attitude enables the landing light beam to be kept on the ground. Tank-filling is easier, and petrol gauges record contents accurately when the aircraft is at rest.

Power Plants

Probably the first post-war transports will be of the four-engined type. Since there must be a limit somewhere to the size and power of engines, four-engined installations will give way to six, as the size of the aircraft increases. Both in this country and America the 2,000 h.p. air-cooled engine is already in use, and improvements in the power/weight ratio for these engines is very encouraging.

With the advent of large aircraft, more consideration can be given to the problem of enclosing the power plants within the wing. Several engines have already been designed for wing installation, an example being the 1,200 h.p. Lycoming o-1230. Actually, for the larger projects even a radial engine could be completely housed within the wing. The airscrew must be driven through some form of extension shaft to ensure that there is no aerodynamic interference over the top surface of the wing. This would probably be done by an extended nose section integral with the engine. This would not be so susceptible to vibration as the normal extension shaft, and adequate space would be available in the nose section for reduction gearing, etc. The long nose section necessary has already been proved possible and demonstrated on the Pratt and Whitney Twin-Row Radial which was installed in a number of experimental aircraft. Adequate cooling air intake could easily be provided through ducts in the leading edge of the wing. These could be integral ducts and include sufficient flow for cooling the engine and oil. Hydraulically controlled air exit flaps would be provided in the rear portion of the wing.



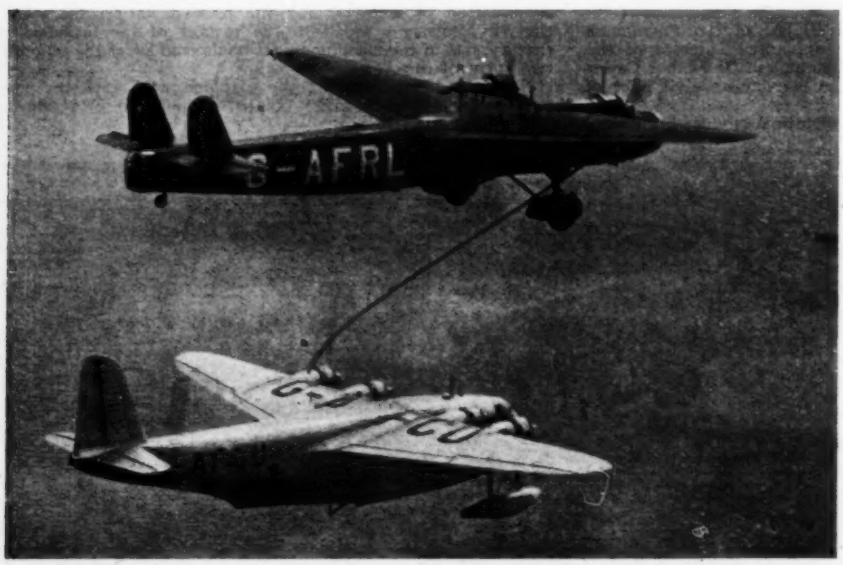
The 1,200 h.p. horizontally opposed 12-cylinder Lycoming o.1230 engine. Length 106⅜in., width 44in., height 38in., weight 1,325lb.

Prime Movers

In July of last year Lt.-Col. Moore-Brabazon (now Lord Brabazon of Tara), then Minister for Aircraft Production, warned a distinguished gathering not to remain content with thinking of the petrol engine and airscrew as we knew them, but to consider other possible developments. The Minister may have been thinking of some form of jet propulsion. It is not beyond the bounds of possibility that jet propulsion may play its part sooner or later in the post-war era. Turbine-driven airscrews are another possibility.

The great improvements in flexible fuel tanks bordering on the ideal of a "crash-proof tank" will greatly reduce the risk of fire breaking out in a crash landing, and improved methods of propulsion may eliminate this hazard almost entirely as time goes on.

These are only a few of the problems and possibilities to be considered in the future air transport. The modern application of plastics to aircraft construction will be prominent in the post-war transport planes, though it may be some time before a plastic material proves equal



The Short C-class boat *Cabot* being refuelled in the air from a Handley Page Harrow operating with Flight Refuelling Ltd. The connecting hose is being pulled into the tail of the flying boat.

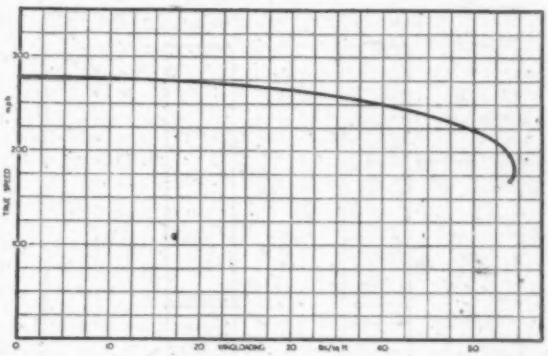
TRANSPORT AIRCRAFT

to being employed for the primary structure. There are, however, so many components in which plastics can be used with advantage that the plastics section of the industry should be well represented.

Flight Refuelling

Future types on the transatlantic and other long-distance, non-stop routes will probably be refuelled in the air. Flight Refuelling, Ltd., formed some years ago by Sir Alan Cobham, K.B.E., A.F.C., carried out some very important trials during 1938 when they were working on the problems of the Atlantic service. On this service, between August and October, 1939, sixteen crossings were made, and the refuelling operation was successfully performed on 15 out of the 16 occasions; on one occasion refuelling was not necessary.

According to Sir Alan Cobham and Mr. Marcus Langley, in a lecture delivered before the Royal Aeronautical Society on April 12th, 1940, the conclusions drawn from the Atlantic tests were that the refuelling equipment was adequate and required no modification, and that future types could be designed to show an enormous advantage over any non-refuelled machine. The next generation of air liners which was to operate long-range services should, the lecturer said, be designed from the start to take advantage of refuelling. The machine must be of clean outline and of sufficient structural strength to allow of its carrying a load equivalent to 50 to 60 lb. sq. ft. when taking off or landing. The take-off power should be such as to give a power loading of 7 to 10 lb./b.h.p. at take-off weight. Cruising power loading would then be of the order of 20 lb./b.h.p. at the refuelled all-up weight. Such an aircraft would be capable of flying non-stop from England to New York with a large pay-load. A large section of the paper was devoted to the consideration of a hypothetical orthodox four-engined air liner with the characteristics and performances summarised in the accompanying graphs.



Cruising speed on maximum economic cruising power at 15,000ft. 660 b.h.p. cruising power per engine. Four engines.

With a still-air range of 5,000 miles it would be possible for such an aircraft to encircle the world with stops at Cairo, Bombay, Singapore, Darwin, Sydney, Suva, Honolulu, Vancouver and Quebec. With suitable branch airlines it would be possible to handle all the main routes of the world with some 15 refuelling stations. No oversize airports would be necessary, since the aircraft would always take off relatively light. It would seem that refuelling in flight will be of some importance in the post-war era for use with the large air transports already envisaged.

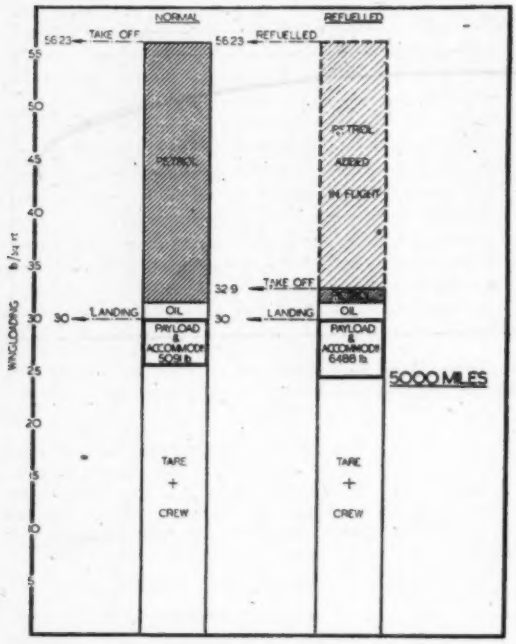
Short-Mayo Composite

The most successful experiments carried out from 1930 onwards with the Short-Mayo composite aircraft designed and built by Short Bros., Ltd., to test out Major R. H. Mayo's theories, upon which at the time the attention of the whole world was focussed, is certain to be revived in post-war aviation.

The *raison d'être* of the composite

A hitherto unpublished *Flight* photograph of the Short-Mayo composite aircraft. The upper component, *Mercury*, was a seaplane with four Napier Rapier engines of 395 h.p. each. The lower part was a flying boat closely resembling an Empire boat.

TRANSPORT AIRCRAFT



Wing-loading of aircraft designed for 5,000 miles range with an all-up weight of 66,130 lb.

was to extend the range of an aircraft by assisting it into the air with a greater load than that which it could lift into the air under its own power.

In the Mayo scheme a large but lightly loaded flying boat is used for carrying on its back a much smaller but very heavily loaded floatplane and helping it into the air. When the desired height is reached the two aircraft separate, the smaller proceeding on its long journey, and the larger flying boat returning to its base.

England-Egypt Non-stop

In July, 1938, the upper component, the *Mercury*, demonstrated by its flight from Foynes to Montreal, a distance of 2,860 miles in 20 hours 20 minutes, carrying a payload of 1,000 lb., not only the feasibility of transporting a considerable payload from Great Britain to the American Continent against prevailing winds but that the operational costs need not be prohibitive.

Later in the same year *Mercury* flew from Southampton Water to Egypt non-stop with a ton of Christmas mails during a single night, being the first non-stop mail flight to be made between the two countries.

From these and other experimental flights it seems likely that when the intensity of traffic is such that frequent launches could be made in both directions and a composite aircraft service could be operated by at least one lower component at each end and a number of upper components working the shuttle service, the scheme is of considerable practical value, especially for air-mail traffic between the two English-speaking Continents, and within the Empire.

The claim advanced by Major Mayo in the early days of composite aircraft discussion that the scheme would double the range and payload and greatly increase the cruising speed already appears to have been justified.

In the post-war era it is probable that landplane versions of the upper component of very superior performance to the original *Mercury* incorporating all the latest developments for high-speed mailplanes will eventually make their appearance and with the new airfields constructed during the war with lengthy runways in all directions it is legitimate to assume that one or more of these will be available for the landplane lower components for launching.

Merchant Air Service

It is interesting to recall in this article one or two points from an address delivered quite recently by Mr. E. C. Gordon England, managing director of General Aircraft, Ltd., entitled "Merchant Service of the Air."

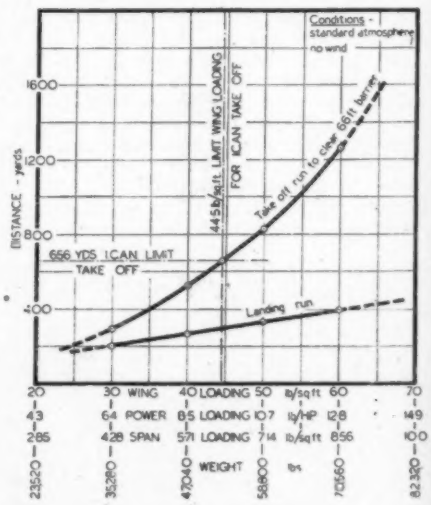
Mr. England claimed that geographically Great Britain is the actual centre-point of nearly the whole of the earth's dry land, from which he argued that we must become the hub of the world's merchant service. He suggested the setting-up of a Commonwealth Board of Merchant Air Services, each nation represented by an appropriate Air Transport Minister. Mr. England estimated a fleet of 5,000 aircraft with a useful load of 20 tons, making a round transatlantic trip once every four days and moving 150,000 tons per week in both directions.

Civil aviation, he argued, should be looked upon as something important to the whole Empire. Mr. Gordon England was invited to repeat his lecture to a group of M.P.s interested in the subject. Sir Alan Cobham, in the discussion that followed, said that air transport was perhaps the single factor most necessary to the survival of the British Empire.

As will be seen, the importance of British air transport is fully appreciated by many. Probably the first of the new British types will be in the region of 100,000 lb. gross weight; from which bigger and better aircraft will eventually mature. Such an unorthodox arrangement as an all-wing-tailless-jet-propelled air transport, with a performance that would far surpass any modern aircraft to-day, is not beyond the realms of possibility within a period of a few years from peace being declared.

Post-war Project

For the present, however, a British air transport project of 100,000 lb. gross weight seems a good starting point for the post-war programme. Perhaps the Government may even yet find it of sufficient importance to cause designs to be got out in readiness for construction at the close of hostilities. Let us hope that the British aircraft industry will never be allowed to sink to that deplorable condition which existed for the ten years or so that followed the previous signing of peace.


Conditions - standard atmosphere no wind
DISTANCE - yards
1600
1200
800
400
445 lb/sq ft LIMIT WING LOADING FOR ICAN TAKE OFF
Take off run to clear 66ft barrier
656 YDS ICAN LIMIT TAKE OFF
Landing run
20 30 WING 40 LOADING 50 lb/sq ft 60 70
43 64 POWER 85 LOADING 107 lb/HP 128 149
285 428 SPAN 571 LOADING 714 lb/sq ft 856 100
23520 35280 WEIGHT 47040 58800 lbs 70560 82320

Comparisons of take-off and landing runs.

The whole British Empire at the present time has an operational fleet of transport aircraft, comprising conversions, makeshifts and cast-offs, totally inadequate to represent the Empire in serving the air routes of the world in the peace to come. Have we to rely upon other nations to do it for us? The British aircraft industry is equal to the task. The Government should decide this vital question at once.

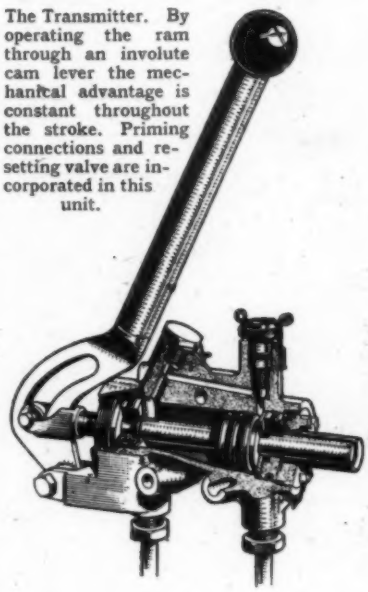
HYDRAULIC REMOTE CONTROL

Messier Type C Equipment With Temperature Compensation

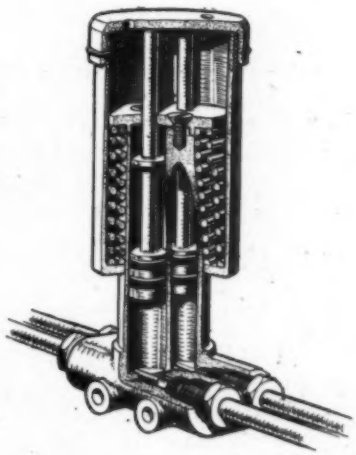
REMOTE control was a problem first examined by Messier in 1937, and two types were soon in production. These types, the Junior and Senior variations, were considered at the time to be an appreciable advance in the technique of transmission of manual control over long and tortuous paths. But considerable operational and laboratory experience has since been acquired, and Rubery Owen Messier, Ltd., have now perfected a new equipment, designated as type C.

This new manually - operated hydraulic equipment has been developed mainly for throttle and airscrew control, but in general it can be arranged to suit any purpose calling for the application of a manually originated movement at a distant point. The efficiency is high, consequently the action is light and smooth, and special provision has been made to eliminate completely any effects due to temperature variations. It is claimed that elastic deflection is negligible, there is no backlash, and the movement is positive in both directions.

There are three main components, the lever-operated transmitter (weight 1.8 lb.); the receiver (1.1 lb.) which is virtually a duplicate of the transmitter; and the compensator (1.5 lb.). For the connections, pipe of ¼in. outside diameter is used. A load capacity of 180 lb./in. torque over a 68 deg. angle is available, equivalent to a 163 lb. push or pull over a 1.34in. stroke.



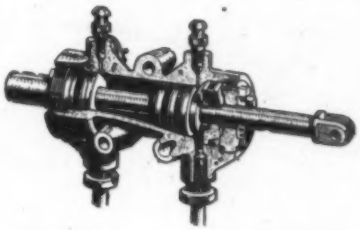
The Transmitter. By operating the ram through an involute cam lever the mechanical advantage is constant throughout the stroke. Priming connections and resetting valve are incorporated in this unit.



Temperature compensation is by two cylinders and pistons which are preloaded by a common spring system.

The receiver is available either with a straight line motion, or with a lever or rotary drive. The transmitter and receiver are, as previously mentioned, almost identical, being in the nature of double acting jacks, although the transmitter has a priming connection and resetting valve, while the receiver has two screw-valve controlled bleeds.

The transmitter lever drives the ram through an involute cam giving a uniform mechanical advantage so that the efficiency is constant and the "feel" is the same at all positions.



The receiver is practically identical with the transmitter except that it has two bleed valves in place of the priming connection and resetting valve.

Providing that the pipes are run closely together the expansion and contraction of fluid due to temperature variations will be the same on both, and the compensator is based on this fact. Both pipelines are led through it, and they are connected to separate chambers in which move pistons. These pistons are loaded by a spring assembly common to both and which is so dimensioned that the compensator pistons will not move under the influence of operating loads up to the designed maximum; they maintain the system under a permanent initial pressure so that backlash is impossible.

As no priming valves are incorporated there is no trouble from this cause, and it is also possible to use the control in conjunction with mechanisms which do not call for the full travel of the operating ram, such as in those cases where external mechanical stops are used. Leakproof glands are a feature of the equipment, the Messier organisation having the widest experience in this direction. In any event, slight loss of fluid is automatically allowed for by the compensator, while adjustment for synchronism is easily effected and does not call for special valves. The compensator casing is engraved with marks to indicate its position at normal fluid level and the need for replenishment is, therefore, checked without dismantling any part.

INDIVIDUALISTIC EFFORTS

THE perfect "after-dinner speech" is practically unreportable because its essential qualities belong far less to its text than its texture.

Thus it is hardly possible to do justice in chilly print to the speeches which accompanied the Ernest Turner Group luncheon, held recently in a West End restaurant, where the commendable austerity of the menu in no way impaired the brilliance of the speakers. Mr. Alan Turner was in the chair.

Sir Frederick Handley Page, guest of honour, was in grand form and, prefixing his more serious observations with the remark that he must be careful what he said lest he tell the enemy something they already knew quite well, expressed the opinion that if this country was going to survive in the peace to come, it would be by those very individualistic characteristics which had built up the Empire and its trade in the past.

"The efforts of the Government to ameliorate our lot," he said, "depend finally upon the efforts of the individual to bring prosperity and so make things better for those less fortunate than ourselves."

Sir Frederick's humorous digs at the official mind, however, were cleverly countered by the penetrating wit of Sir Alexander Cunnison when he responded for the guests, so that, with a bright cabaret and a well-produced sound film of Turner industrial activities, the entertainment value of the function was pleasantly high.

"Peanuts—popcorn—chewing gum!"
—*Air Progress*

A year ago "Flight" introduced this light-hearted feature as a brief but seasonable "break" in the serious business of wartime aviation.

The outlook is far more cheerful now than it was then, so no apology is needed for its reappearance.

They've Said It

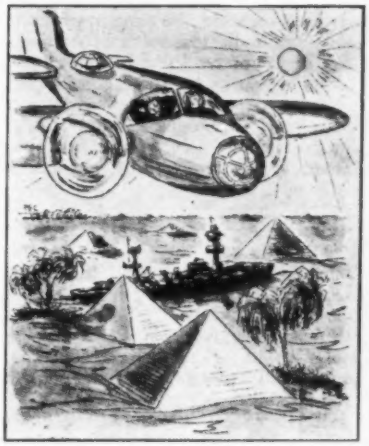
"The amount an airman's kitbag will hold is positively staggering," says a writer.

So is the poor blighter underneath!

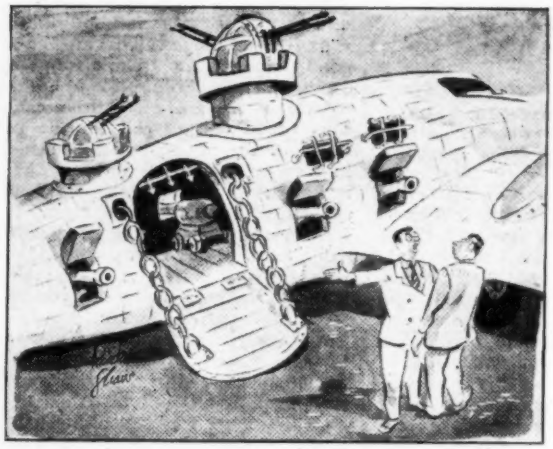
* * *

"Is a pilot officer's pay enough to live on?" asks another correspondent.

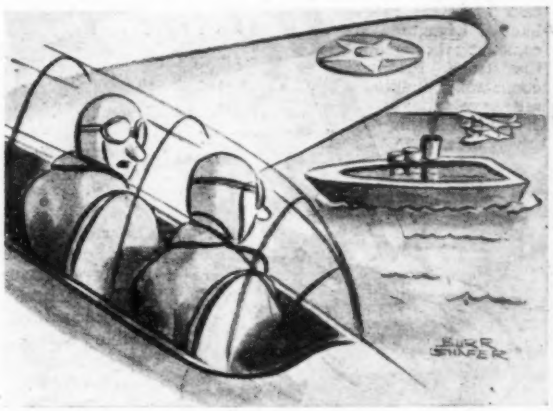
It all depends on what sort of mess he gets in!



"B-4 reporting enemy ship driven out of the Mediterranean Sea. That is all..."
—*Flying*



"We designed it to compete with the Flying Fortress."
—*Flying.*



"That's the Navy's new airplane carrier—for seaplanes."
—*American Aviation.*

Ungrateful

ACCORDING to a Nazi journalist, the *Luftwaffe* is the most expensive part of their armed forces to maintain.

Yet they show no gratitude for the way we are reducing their expenses!

* * *

And They Were!

WHILE being chased by three FW 190s the captain of a Stirling told his crew: "Don't look now, but I think we're being followed."

* * *

Jumping To It

An "Aussie" squadron has two kangaroo mascots.

Lucky bounders!

Tough Job!

ONE of the best American aviation stories of the year involves the wartime practice of drawing window curtains on airliners three minutes before landing and three minutes after taking off. . . .

It seems that a passenger, about to disembark from a plane at an airport recently, was complaining bitterly about this "black-out." . . .

The pilot, walking down the aisle behind the man, tapped him on the shoulder and said: "You think it's tough on you? What about me up there in the cockpit?" . . .

The passenger probably is still recovering from shock.

* * *

(Left) We considered it just a toy until he got a sub-contract from Lockheed!"
—*American Aviation.*

(With acknowledgements to *Colliers*).

"Don't be alarmed, gentlemen — We're directly above Super Studios in Hollywood!"—*Air Progress.*

Unbelievable!

THE R.A.F. sergeant was equipping a new recruit with his uniform. The trousers fitted perfectly, the tunic might have been made for him in Savile Row, the cap was just right.

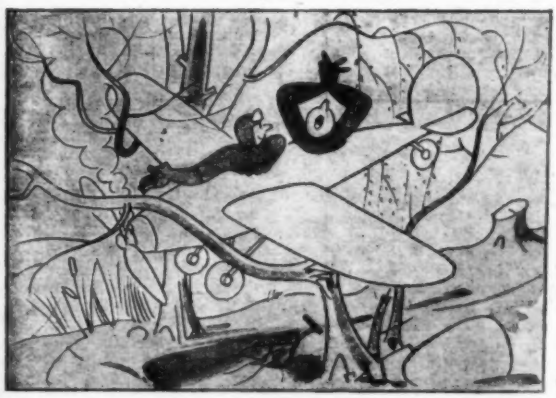
"Lor' love a duck," exclaimed the sergeant, "you must be deformed."

– Gdziebym nie wylądował – muszę skręcić kark . . .

"Wherever I land I shall break my neck." — (From the Polish journal "Wings," published in this country).

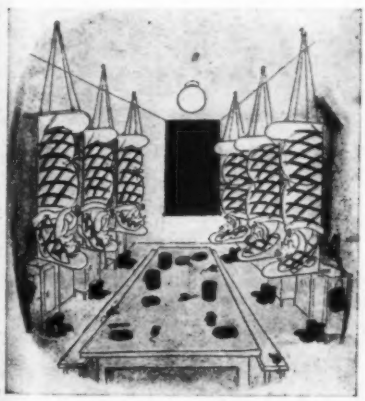
TO MAKE THE LUFTWAFFE LAUGH

Comedy from German Air Journals



The height of impudence—"This is just where I wanted to land!"

"My word, that sounds like a Spitfire!" "No, my son, it's your mother's new vacuum cleaner!"



Only a debutant could believe that Stuka crews sleep head downwards.

Preparatory exercise for Stuka pilots.

Distribution of soup at an air station as the novice imagines it.

Correspondence

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

THE TORPEDO BOMBER

Beaufort or Beaufighter

IF I may, I should like to question a statement in Mr. R. Hudson's letter in *Flight* of December 3rd. He says that the armament of the Beaufighter is purely offensive, but I think I am right in saying that some of these aircraft did have gun turrets in place of the usual astro-hatch. In any case, it would be comparatively easy to fit a turret.

Bearing that in mind, I am more than ever of the opinion that the "Beau" would make a very good torpedo-bomber. No doubt, if time were taken, a better specification could be worked out, but when our apparent policy is (wherever possible) to adapt types, it seems the Beaufighter has enough of the qualities now required in torpedo aircraft to make it worth while being given a trial.

I say very hesitatingly that it is within the bounds of possibility to operate this type from an aircraft carrier. But, if this is not practicable, it would still do well as a land-based machine. I do not know how much better it would be than the Beaufort, but I cannot, on superficial examination, discover any marked disadvantage compared with its sister-type, and it has the obvious advantage of speed, manœuvrability and armament.

"AERO."

FAULTY FILMS

Errors in Newsreel Comments

MAY I be permitted to add my bleat to the current criticisms of aircraft recognition in films. I have this week seen British Paramount Newsreel's version of the North African landings, and was much impressed. But when photographs of a captured airfield are shown, and the commentator refers to an elderly Dewoitine air liner as a Junkers 52 troop carrier and a Potez 63 as a Me. fighter-bomber, I suggest that is slightly stretching things. Also in the early stages of the invasion of the East Indies, I remember seeing a newsreel showing what I should say was a Netherlands East Indies Dornier Do. 24 doing patrol duty, and the commentator blandly talked about Catalinas.

Dare I risk one more poke? In the M.O.I. film "Royal Observer Corps," a plane is shown crashing after raiders have been turned back from their objectives. The plane is leaving a trail behind it and crashes out of sight behind some houses, but what struck me most of all was that the outline, rather dim, was very much like that of a Spitfire!

Now tell me, am I being too much of a realist, or am I just seeing things? Ordinary films might blunder on recognition, but surely newsreels and M.O.I. films should be accurate.

Here's hoping. H. SNELGROVE.

P.S.—Have been a regular reader for several years now. Should like to congratulate you on the maintenance of your highly interesting journal despite, doubtless, restrictions and difficulties. H. S.

AIR TRANSPORTS

Their Value to the Army in Africa

THE recent actions in North Africa show, and emphasise perhaps better than any previous arguments have done, that there is a great need for aircraft of the transport type, both for short-range tactical work and also as high-speed carriers of freight from bases in Britain and America.

We have been told that production of such a type has started in this country and we know, of course, that the U.S. is well advanced in this respect. It is therefore the responsibility of the Powers-that-Be to see that we build up, in the near future, an adequate number of these aircraft so that we have a rapid means of transport for troops when the need is sufficiently great, and for vital supplies to be brought up to the forward fighting areas.

Land and marine types will be necessary, although the latter appear to be more suitable for building as regards increased size and quick production, and also in view of the fact that flying-boats require less ground organisation than similar land aircraft.

Now that we have occupied large portions of West Africa it is certain that there will be much scope for these machines in connecting up communications to Britain. The distance is not too great and should in fact enable them to be used to best advantage. It should also be possible to supply them with fighter protection the whole way if this were necessary.

In the Mediterranean theatre, too, it would be great strategic value to have a fleet of big transports, ordinarily used for routine duties, but ready in an emergency to move comparatively large numbers of troops in little or no time.

This is especially so when we can gain such decisive air supremacy as the Eighth Army has had over Rommel's forces in the past few weeks. In Africa, under such an umbrella and with a few hundred transports, we could soon have moved enough troops and equipment to overwhelm the original German paratroops force landed in Tunisia.

The enemy saw the wisdom in this method and used Italian Savoia 81s to carry German troops. Fortunately for us the Germans did not possess air supremacy. The result was that the six of them were shot down with the loss of over 200 men. Possibly they had not even a small fighter screen for protection. With adequate air cover the whole situation would be altered.

There is no reason for the transport to remain continually as such; it could also be used for long-range reconnaissance.

Up to the present much of the tardiness in adopting the type for large-scale use has been due to the need to concentrate on "more war-like" aircraft in the belief that transports are not essential. Neither are they to the Air Force, but in the Army they should be regarded as every bit as necessary as tanks and guns.

Only when such a state of affairs is accepted will our Army obtain the fullest possible measure of mobility.

CLYDE.

BOOST PRESSURE VARIATION

Why Reduced Piston-load Raises It

BEING concerned with the design of aircraft engine boost control units, I am in a position to offer your correspondent "Puzzled" (*Flight*, Nov. 19th) some enlightenment on the reasons why the boost pressure may vary from a pre-set value when the speed of the engine is changed.

As air is drawn past the throttles into the engine, a torque is produced on the throttle spindles tending to close them. If they are to be maintained in an open position, a counteracting force must be supplied by the boost servo piston to oppose the closing torque. This force is created by a pressure differential across the piston, and obviously the pressure difference will vary with changing loads. The piston does not effect a perfect seal in its cylinder, and consequently the working fluid is induced to flow past the piston to the low pressure side.

In order that this flow can be accommodated, the servo valve of the boost control must be displaced from the neutral position to expose sufficient area of the controlling ports for this purpose, the amount depending upon the rate of flow past the piston. If, now, we imagine the boost control unit as being set to control at a particular datum boost when the torque exerted by the throttles is at a definite value, then it is apparent from the reasons given that the valve will move to a new position if this value is altered. Since the valve is attached directly to the boost responsive bellows, it follows that the new condition can only be achieved by an alteration in the boost pressure applied to the bellows.

If the load on the piston is reduced, the boost pressure must increase slightly to move the valve towards the neutral position, i.e., in the direction that would normally close the throttles. As mentioned already, the torque is produced on the throttles aerodynamically, and this decreases as the mass airflow into the engine falls off. Hence, when the engine revs are pulled down by coarsening the airscrew pitch at a given boost setting, the mass flow will decrease with a consequent reduction of the throttle torque. For this reason the boost will rise when the engine speed is reduced.

The extent to which the boost will vary depends upon certain features in the design of the unit and in particular upon the pressure rate of the bellows and the shape of the controlling ports.

L. S. GREENLAND.

Service Aviation

Royal Air Force and Fleet Air Arm News and Announcements

Promotions

The London Gazette, December 8th, 1942.

GENERAL DUTIES BRANCH.

Air Vice-Marshals (Act. Air Marshals) to be Air Marshals (temp.), December 1st, 1942:—
T. L. LEIGH-MALLORY, C.B., D.S.O.
R. H. PECK, C.B., O.B.E.
P. BABINGTON, C.B., M.C., A.F.C.
A. G. R. GARROD, C.B., O.B.E., M.C., D.F.C.
Sir A. T. HARRIS, K.C.B., O.B.E., A.F.C.

The London Gazette, December 11th, 1942.

TECHNICAL BRANCH.

Grp. Capt. D. H. DE BURGH, A.F.C., to be Air Cmdre. (temp.). November 1st, 1942.

Awards

Fleet Air Arm

THE KING has been graciously pleased to give orders for the following appointment to the Most Excellent Order of the British Empire:—For bravery and distinguished services at Malta.

M.B.E. (MIL.).

Lt. (A) E. D. CRABB, R.N.

MENTION IN DESPATCHES.

Air Art. 4th Cl. B. J. SOPER.

Act. Sqn. Ldr. M. M. Stephens, D.S.O., D.F.C., of No. 229 Squadron, who has been awarded a second Bar to his D.F.C. for fighting over Malta.

Six de Havilland Mosquito light bombers ready to take off for daylight operations over occupied Europe.

Royal Air Force

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy:—

DISTINGUISHED SERVICE ORDER.

Act. Wing Cdr. D. J. H. LAY, D.F.C., No. 15 Sqn.—Since being awarded a Bar to his D.F.C., this officer has continued to show exceptional keenness and devotion to duty, whilst his magnificent leadership has contributed much to the fine record of operational achievement maintained by the squadron he commands.

Act. Sqn. Ldr. A. WATSON, D.F.C., No. 272 Sqn. (since reported missing).—One day in November, 1942, this officer led a formation of aircraft on a low level attack on the airfield at El Agheila, where at least 12 enemy aircraft were destroyed on the ground and many others damaged. During a patrol the next day, a He 115 was destroyed. On the third consecutive day, the squadron was detailed to attack an airfield in Tunisia. En route, a formation of six S.M.82's was intercepted. In the ensuing engagement, all the enemy aircraft were shot down; Sqn. Ldr. Watson destroyed three of them himself. This officer has led the squadron on shipping sweeps and convoy escorts and in numerous low level attacks on enemy airfields during which many enemy aircraft, vehicles and E boats have been destroyed or damaged. He has destroyed 11 enemy aircraft as well as a schooner.

Wing. Cdr. A. C. BROWN, D.F.C., No. 407 Sqn.—This officer, by his personal tact and example, has been largely responsible for the sound morale and efficiency of his squadron. He has led the squadron on all its heavy raids, including one on Bremen on the night of June 25th. Wing Cdr. Brown has personally obtained five hits on enemy merchant vessels.

Sqn. Ldr. C. S. G. STANBURY, D.F.C., No. 70 Sqn.—Since the award of the D.F.C., this officer has completed a number of operational sorties. Sqn. Ldr. Stanbury has no regard for his personal safety and is always first to volunteer for hazardous tasks. On one occasion an aircraft had crash-landed in the desert, too far from base to be salvaged. The whole undersurface of the fuselage was ripped away, but Sqn. Ldr. Stanbury successfully flew it to base for rebuilding.

Lt.-Col. J. A. G. RADEMAN, S.A.A.F., No. 24 (S.A.A.F.) Sqn.—This officer has a distinguished record of service in Abyssinia and the Western Desert. Since being awarded the D.F.C. he has led his squadron on many operational sorties.

BAR TO DISTINGUISHED FLYING CROSS.

Wing. Cdr. A. H. DONALDSON, D.S.O., D.F.C., A.F.C.—Since his arrival in Malta this officer has taken part in numerous operational sorties. On August 27th he was responsible for the briefing and leading of a highly successful low-flying attack on three Sicilian airfields. On this occasion at least ten enemy aircraft were destroyed and probably a number of others over Sicily. He was awarded the D.S.O. in November, 1942.

Wing Cdr. J. M. THOMPSON, D.F.C., R.A.F.O.—This officer, who took part in the Battle of Britain, has since completed numerous operational sorties over Sicily. One day in October, 1942, he led his section with such skill that a formation of three hostile aircraft was totally destroyed. Some days later he was in the leading aircraft of a formation which attacked seven heavy bombers with an escort of fifty fighters. As a result of his interception the bombers were scattered before they could release their bombs. He has been responsible for the destruction of ten enemy aircraft and many more damaged.

DISTINGUISHED FLYING CROSS

Act. Sqn. Ldr. G. ASHFIELD, A.F.C., No. 157 Sqn.—This officer has completed numerous sorties, many of them in adverse weather at night. By his skilful and untiring efforts he has contributed materially to the successes achieved by the squadron he commands. He has destroyed two, and probably destroyed further, enemy aircraft.

Act. Sqn. Ldr. W. D. G. WATKINS, D.F.M.—Since being awarded the D.F.M., this bomb aimer has participated in many operational sorties. In October, 1942, he took part in an attack on Genoa and made four runs over the target area to ensure his bombs would strike their objective. On a previous occasion he was detailed to act as navigator and bomb-aimer on a sortie over Hamburg. Despite the terrifically heavy defences, he made four runs over the target and obtained two excellent photographs.

Air/Sea Rescues

P/O. T. E. HILTON, R.A.A.F., No. 277 Sqn.—This officer has performed splendid work as a pilot of the air/sea rescue service. In August, 1942, he was mainly instrumental in saving three members of the crew of an aircraft which had crashed into the sea some 45 miles off the East Coast. One day in October, 1942, he was detailed to rescue a pilot from the sea a few miles from the French coast. On arrival at the scene he found that the pilot was floating in his dinghy between two parallel rows of mines. Nevertheless, he brought his aircraft down on to the water and taxied to the dinghy, passing between two mines with but little room to spare. A rope was thrown to the stranded pilot, who was safely pulled on to the aircraft. Whilst taking off, P/O. Hilton observed a mine dead ahead, but, with great presence of mind, he was able to avoid it by bouncing his aircraft off the water.

P/O. R. INWOOD, R.A.F.V.R., No. 3 Sqn.—This officer has completed numerous sorties at night, including many intruder operations over enemy-occupied territory. In June, 1942, during an intruder sortie over an airfield in Holland, he destroyed an enemy aircraft. On another occasion, in July, he destroyed a Ju 88. Although his own aircraft was damaged in the combat, P/O. Inwood flew it safely back to base.

P/O. A. T. DOUCETTE, R.C.A.F., No. 425 (R.C.A.F.) Sqn.—In November, 1942, P/O. Doucette and Sgt. Bruyere were captain and wireless operator respectively of an aircraft detailed to attack an objective in North West Germany in daylight. On the outward flight the aircraft was attacked by three enemy fighters. Sgt. Bruyere was seriously injured, sustaining a broken leg, and wounds in the chest, arm, forehead and left hand. A member of the crew when going to his assist-

SERVICE AVIATION

ance stepped on the escape hatch and fell through it, but Sgt. Bruyere caught him and assisted him back to safety. When the engagement with the enemy aircraft was terminated, P/O. Doucette flew on and attacked his target. On the return journey, Sgt. Bruyere, despite his critical condition, advised his colleagues on the operation of his wireless equipment.

Wing Cdr. G. P. SEYMOUR-PRICE, R.A.F.O., No. 10 Sqn.—In September Wing Cdr. Seymour-Price led his squadron in an attack on Heraklion, in Crete. One aircraft was forced to return with engine failure, and his second section broke off to attack at a different angle, leaving Wing Cdr. Seymour-Price with a section of only two aircraft. In the face of intense anti-aircraft fire the attack was pressed home, but his companion was shot down in flames, and Wing Cdr. Seymour-Price's aircraft severely damaged. On the return journey he was attacked by a fighter but, with great skill and daring, he manœuvred his aircraft away into the mountain valleys where it was impossible to continue the combat. He then flew safely back to base and, despite the disabled condition of his aircraft, made a perfect landing.

Harrying Transport

Sqn. Ldr. M. BOOTH, No. 40 Sqn.—Sqn. Ldr. Booth is a pilot of exceptional brilliance and determination. One night in June he was detailed to attack concentrations of enemy transport on the Tobruk-Derna road. He successfully located and bombed a column of transport and although extremely heavy anti-aircraft fire was encountered he proceeded to make a further search for more concentrations of transport. During this attack, made in the face of intense opposition, his rear gunner was seriously wounded and his aircraft badly damaged, but Sqn. Ldr. Booth with great skill flew it safely back to base.

Act. Sqn. Ldr. W. A. DOUGLAS, A.A.F., No. 229 Sqn.—In June, 1941, Sqn. Ldr. Douglas took part in a number of offensive sorties over Northern France, during which he destroyed one enemy aircraft. Later in the month he was shot down and wounded, and on returning to operations in November he participated in a mission in which two out of eight flak ships were sunk. Altogether he has destroyed twelve hostile aircraft.

Act. Sqn. Ldr. R. A. MITCHELL, R.A.F.V.R., No. 249 Sqn.—Since his arrival in Malta, Sqn. Ldr. Mitchell has destroyed at least seven hostile aircraft. It is mainly due to this officer's efforts that his squadron heads the list for the destruction of enemy aircraft on the Island.

Act. Sqn. Ldr. E. W. WHITAKER, R.A.F.O., No. 216 Sqn.—During the Greek campaign this officer flew supplies to forward areas within fifteen miles of the enemy. Early in 1942 he was responsible for the evacuation of over 500 casualties in one month from the Msus area. In addition he has taken part in the regular routine service of air transportation of supplies, mail, etc., in the Western Desert.

Flt. Lt. W. R. ACOTT.—Since February, 1942, this officer has commanded a flight and has completed a number of successful missions. Flt. Lt. Acott has always shown great keenness in his work and has set a very fine example to all in his flight.

Flt. Lt. R. H. ANGAS, R.A.A.F.—Since the commencement of the 1941 Libyan offensive this officer has been actively engaged on advanced communication. He has been responsible for flying high Army personages and urgent despatches into the forward battle areas, locating army corps H.Q. and units and crashed aircraft. These duties have been performed in most difficult country, often under adverse weather conditions and frequently in the face of heavy enemy opposition.

Flt. Lt. C. H. SAUNDERS, No. 74 Sqn.—One day in July, 1942, this officer led a patrol of Spitfires in an attack on a formation of ten enemy fighters. In the ensuing engagement he destroyed one but was wounded in the head and neck by a cannon shell. Nevertheless, Flt. Lt. Saunders continued the combat, and, with great skill and fortitude, flew his very badly damaged aircraft safely back to base. Flt. Lt. Saunders has destroyed at least five enemy aircraft and damaged others.

Flt. Lt. N. D. SINCLAIR.
P/O. W. NELSON.

In October, 1942, Flt. Lt. Sinclair and P/O. Nelson were pilot and observer respectively of an aircraft detailed to make an operational flight to Norway. Adverse weather prevented location of the primary target. The weather grew progressively worse, and they were unable to pin-point their position. Eventually, an airfield in German hands was located and severe anti-aircraft fire was encountered. Flt. Lt. Sinclair flew on and, ably and skilfully directed by P/O. Nelson, finally reached base, where a successful landing was made.

Act. Flt. Lt. A. C. BAKER, R.A.F.V.R., No. 112 Sqn.—Prior to his service in the Western Desert, Flt. Lt. Baker participated in fighter sweeps over France and also took part in the Battle of Britain. Since May, 1942, he has completed a large number of bombing and machine-gunning sorties, and has, on some occasions, led his squadron. This officer has been responsible for the destruction of at least three hostile aircraft.

Sea Level Recos

Act. Flt. Lt. W. M. B. GRIFFIN, R.A.F.V.R., No. 268 Sqn.—This officer has had a varied operational career. He has led many sea-level reconnaissances in every type of weather. These operations have involved extremely accurate navigation and flying skill, and have resulted in much valuable enemy shipping information being obtained. He has also led two attacks on shipping and locomotives over Northern Holland.

Act. Flt. Lt. J. E. G. HANCOCK, R.A.F.V.R., No. [illegible] Sqn.—This officer, as navigator/bomb aimer and later as wing navigator officer, has completed many operational flights over Germany, France and the Middle East.

Act. Flt. Lt. J. H. HOSKINS, R.A.F.V.R., No. 221 Sqn.—This officer has shown the very highest degree of devotion to duty, skill and determination. He has sighted several enemy convoys at night, thus enabling torpedo attacks to be made. He has done much to raise the standard of efficiency within his squadron, and his ability is such that any difficult mission is always undertaken by him.

Capt. H. E. N. WILDSMITH, S.A.A.F., No. 2 (S.A.A.F.) Sqn.—This officer has participated in a large number of sorties, including numerous fighter escorts and sweeps. On one occasion in July, 1942, during an escort flight, his squadron engaged a formation of enemy bombers and destroyed four of them. Throughout the engagement, Capt. Wildsmith displayed great courage and initiative. In October, 1942, his squadron was detailed to escort a bomber force well into enemy territory. Whilst over the target area, Capt. Wildsmith became separated from the formation and his aircraft was attacked by ten enemy fighters. Displaying great skill, he destroyed one of the attackers and frustrated the efforts of the others until he was able to rejoin his formation. He has destroyed at least three enemy aircraft.

F/O. A. U. HOULE, R.C.A.F., No. 213 Sqn.—One evening in October, 1942, F/O. Houle was flying with his squadron on patrol over El Alamein when a formation of enemy dive-bombers was sighted. The enemy aircraft jettisoned their bombs and flew west in an attempt to avoid combat. With great tenacity and determination F/O. Houle pursued them far over the enemy's lines and in the rapidly falling light, engaged and destroyed at least two of the hostile bombers.

Flt. Lt. J. R. HUTCHESON.—This officer served in England during 1940. In 1941 he was in action at Singapore on numerous occasions. He has destroyed one and damaged another enemy aircraft. Twice he has made a skilful crash-landing.

DISTINGUISHED FLYING MEDAL

Sgt. G. J. R. BRUYERE, R.C.A.F., No. 425 (R.C.A.F.) Sqn.—For citation see P/O. Doucette.

Sgt. J. D. PICKERING, R.A.F.V.R., No. 120 Sqn.

Flt. Sgt. T. TEMPLEMAN, No. 7 Sqn.—Flt. Sgt. Templeman was captain of an aircraft which attacked an objective in the Rhineland one night in June, 1942. On the return flight his aircraft was attacked by two Ju 88s and severely damaged. In most hazardous circumstances which followed, this airman displayed great fortitude and determination, in keeping with the highest tradition of the R.A.F.

Sgt. R. J. WRIGHT, R.N.Z.A.F., No. 142 Sqn.
Sgt. W. SCARLETT, No. 142 Sqn.—In November, 1942, Sgts. Wright and Scarlett were captain and bomb-aimer respectively of an aircraft detailed for a mine-laying sortie. While flying over an extremely heavily defended area they were subjected to intense anti-aircraft fire and later attacked by an enemy night fighter. The observer was seriously wounded in the arm, and the pilot in the right hand, right leg and chest. Showing outstanding fortitude and skill, Sgt. Wright, ably assisted by Sgt. Scarlett, flew his aircraft safely back to this country. Several times when over the sea Sgt. Wright fainted, but Sgt. Scarlett administered oxygen and took over control of the bomber, thereby conserving his pilot's strength to enable him to make a landing.

Flt. Sgt. J. H. BALLANTYNE, R.C.A.F., No. 229 Sqn.—Since June, 1942, this airman, a pilot, has destroyed at least five enemy aircraft and damaged others. One day in July, 1942, he became separated from his section, but with courage and determination attacked three Me 109s, destroying one. Some days later Flt. Sgt. Ballantyne was leading his section when the squadron attacked a formation of enemy bombers. The bombers were successfully intercepted and pursued to within ten miles of the Sicilian coast. On yet another occasion this pilot attacked three Ju 88s, and then, while separated from his squadron, was attacked by four enemy fighters. By skilful manœuvring and great tenacity he fought off the enemy fighters and landed his aircraft safely.

Tanker Attacks

Flt. Sgt. G. B. BRIGG, R.A.A.F., No. 38 Sqn.—In June, 1942, this flight sergeant was captain of an aircraft which successfully attacked an enemy merchant ship off the coast of Libya. Again in July, 1942, he was detailed to attack an enemy tanker escorted by a destroyer in the Mediterranean. At low altitude and in the face of intense anti-aircraft fire, he pressed home his attack. Then, although subjected to heavy fire from both the target vessel and the escorting destroyer, he launched another attack. This he did with total disregard for his own safety and a direct hit on the enemy tanker resulted. By expert airmanship he then manœuvred his aircraft to safety from a position which gave the enemy gunners a point-blank range.

Flt. Sgt. W. BURNS.—Since the commencement of the 1941 Libyan offensive Flt. Sgt. Burns has been actively employed on advanced communications and has flown, at times, under extremely difficult and hazardous conditions. His duties have been both responsible and varied, including flying high Army personages and urgent despatches in forward battle areas, and locating lost Army units and crashed aircraft.

Flt. Sgt. H. NIXON, R.A.F.V.R., No. 221 Sqn.—Flt. Sgt. Nixon has several times sighted enemy convoys and his reports have considerably assisted the striking forces in their attacks. On one occasion he was forced to bring his aircraft down on the sea and, together with his crew, spent four days in a dinghy before being rescued.

Flt. Sgt. D. A. OXBY, No. 89 Sqn.—Flt. Sgt. Oxby as observer has given his pilot valuable assistance at night, enabling him to shoot down at least seven enemy aircraft. One night in October he took part in a successful interception at 22,000 feet without using oxygen, in order that his pilot could obtain benefit of the little that was left. He also participated in five intruder patrols over Sicilian airfields and several convoy patrols.

Flt. Sgt. A. H. SCOTT.—Since July, 1942, this airman has destroyed four enemy aircraft and damaged others, bringing his total victories to five. One day in October he was flying with his squadron when an attack was made on six heavy

LOOKING INTO THINGS: An R.A.F. Intelligence sergeant scrutinising air photographs of Rommel's runways and runaways.

enemy bombers. After attacking one of the bombers, Flt. Sgt. Scott attacked the fighter escort and destroyed one fighter before having to break away as his ammunition was exhausted.

Flt. Sgt. R. STEWNER, R.C.A.F., No. 40 Sqn.—Flt. Sgt. Stewner is a pilot of exceptional ability and his operational career has been characterised by courage and daring. One night in July he was detailed to attack shipping at Tobruk. Intense and accurate gunfire was encountered and the aircraft was caught in the glare of searchlights. Flt. Sgt. Stewner took violent evasive action and successfully completed his task. On many occasions he has shown the greatest determination to press home the attack in the face of heavy enemy opposition.

Flt. Sgt. F. D. H. WILKS, No. 159 Sqn.—One day in July, 1942, Flt. Sgt. Wilks was detailed to fly one of eight aircraft in a daylight attack on enemy positions. The formation was attacked by the enemy and broken up, but with great determination he continued on his mission. On another occasion this pilot was detailed to attack Tobruk and spent 45 minutes over the target area before his crew managed to release the bombs.

BRITISH EMPIRE MEDAL (MIL.).

Sgt. A. HILL.—Sgt. Hill was the rear gunner of a Wellington aircraft which crashed and caught fire during an afternoon in July, 1942. Although injured in the crash this airman managed to free himself from the wreckage. He then ran immediately to the front of the aircraft to assist other members of the crew to escape. All entrances to the aircraft were obstructed but, with the assistance of a civilian who had arrived on the scene, parts of the wreckage were removed and he was able to pull an injured and unconscious member of the crew out of the wreckage before he himself collapsed. During this operation the aircraft was blazing furiously and the petrol tanks exploded very soon after Sgt. Hill had effected the rescue.

L.A/C. W. G. LAKER.—One night in May, 1942, a Beaufighter aircraft crashed in an upside-down position on an airfield and burst into flames. L.A/C. Laker, an ambulance driver, and another airman were the first to arrive on the scene. The pilot's cockpit was so badly damaged that nothing could be done to extricate the pilot. L.A/C. Laker proceeded to rescue the observer, but found that the observer's hatch was jammed. The heat was intense and ammunition was exploding, but, with the aid of foam which was sprayed over him from the fire tender L.A/C. Laker was eventually able to open the hatch. He entered the aircraft, removed the unconscious observer's entangled parachute and other safety appliances, and passed him out to safety. By his prompt and gallant action L.A/C. Laker saved the observer's life.

A/C.1 J. J. MCCARTHY.—One day in March, 1942, a Master aircraft crashed on an airfield, and immediately burst into flames. With only his tunic over his head to act as a protection, A/C. McCarthy dashed into the flames in an effort to rescue the pilot, but was forced to withdraw when his tunic caught fire. He then seized a fireman's asbestos headpiece and made a second attempt to effect a rescue. Showing complete disregard of the flames which enveloped the unprotected part of his body, and ignoring the danger which would arise if the petrol tanks exploded, he succeeded in extricating the unconscious pilot from the cockpit of the fiercely burning wreckage. Throughout A/C. McCarthy showed great courage and determination. Unfortunately the pilot died two days later.

Roll of Honour

Casualty Communiqué No. 185.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

The new Army Co-operation Command Crest approved by the King. The motto reads :—Diverse arms with one object.

Royal Air Force

KILLED IN ACTION.—Sgt. N. F. Brassington; P/O. H. C. Johnson; Flt. Sgt. G. A. Kenyon; P/O. R. C. Lynch; F/O. I. W. Matthews; Sgt. T. McM. Moore; P/O. J. H. V. Nelson; Sgt. A. M. Parkin; Sgt. D. I. Pearce; P/O. T. J. Penney; Sgt. V. Picken; Sgt. W. L. Strang; Sqn. Ldr. T. Waddington; Sgt. E. Watson; Sgt. I. L. Wethered.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—P/O. G. Wilkinson.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. C. F. Curtis; Wing Cdr. A. Golding, D.F.C.; Sgt. M. D. Gould; Sgt. A. J. Griffiths; Sgt. D. Henderson; P/O. K. P. S. O'Donnell; Sgt. A. T. R. Renshaw; Flt. Lt. T. H. Tozer; F/O. R. P. Worthy.

WOUNDED OR INJURED IN ACTION.—Act. Flt. Lt. A. G. Baring; Sgt. C. W. Davies; P/O. J. C. Joerns; Sgt. B. A. Leahy; Sgt. A. G. Parsons; Flt. Sgt. S. G. Pickard; Flt. Sgt. J. Souden; Sgt. T. G. Willcocks.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. A. J. Adams; Sgt. F. B. B. Bayly; Sgt. J. Sweeney.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. F. W. Baker; Sgt. H. J. Balkwill; Sgt. E. A. Berrett; Sgt. L. Cowen; Sgt. E. L. Dickerson; Sgt. R. E. Evans; Sgt. K. Forster; Sgt. D. S. McNeil; Sgt. K. L. Mathews; Sgt. A. Mills; Sgt. T. C. F. Orr; Sgt. J. J. Parish; Sgt. F. G. E. Pierson; W/O. L. Rosekilly; Sgt. S. M. Selway; P/O. R. E. Thornley; P/O. R. A. Tucker; Sgt. S. F. Wells; Sgt. J. D. Whitehead.

MISSING.—Sgt. J. Bradley; Sgt. L. R. Clarke; Sgt. J. S. Cooper; Flt. Sgt. G. H. P. Dean; Sgt. M. J. Deans; F/O. E. E. Doorly; Flt. Sgt. I. Farrell; Sgt. F. S. Fish; Sqn. Ldr. D. S. Forsyth, D.F.C.; P/O. A. L. Foster; Sgt. S. M. Girvin; Flt. Sgt. W. Graham; Sgt. W. F. Gray; P/O. D. D. Gudmundsen; Act. Flt. Lt. A. E. Hacking; Sgt. D. E. Harrison; Sgt. T. A. Jeffies; Flt. Lt. D. Laing; Sgt. J. Law; Flt. Sgt. L. Lothian; Sgt. J. D. Love; Sgt. J. W. McFarlane; L.A/C. H. McKinnon; L.A/C. M. McKinnon; Sgt. R. H. McLelland; Act. Flt. Lt. I. Maitland, D.F.C.; Sgt. R. J. Mumford; P/O. L. W. O'Hara; Sgt. R. Oxley; P/O. H. O. Peel; A/C.1 L. H. Prior; Sgt. E. D. B. Rae; Sgt. S. B. Ronaldson; L.A/C. P. A. Shelton; L.A/C. T. S. Taply; P/O. R. C. Taylor; Flt. Sgt. C. F. W. Underwood; Sgt L. D. Vince; Sgt. T. R. Whitehead; Sgt. J. Wright.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—L.A/C. C. B. Gould; Cpl. L. J. Harding; L.A/C. S. R. Heal; A/C.1 J. McKinney.

KILLED ON ACTIVE SERVICE.—Sgt. K. G. Adcock; A/C.2 W. H. Archer; Sgt. D. G. W. Arnold; Sgt. W. Bakes; Sgt. R. Band; P/O. I. H. Betts; Sgt. G. C. Boar; P/O. P. A. Bourke; Sgt. J. Bowery; F/O. D. F. H. Brown; Sgt. J. Bumpstead; Sgt. D. A. Camm; Sgt. C. A. G. Cox; Sgt. J. C. Dalton; Flt. Lt. T. D. H. Davy, D.F.C.; A/C.2 G. H. Dornin; P/O. J. I. Evans; Sgt. P. B. Fenton; Sgt. W. J. Ferguson; Sgt. J. C. Freestone; Sgt. L. T. Griffin; Sgt. J. H. Hall; L.A/C G. Harris; Sgt. R. W. Hewett; A/C.1 L. Holloway; L.A/C. D. J. Johnson; Sgt. G. R. Johnson; A/C.2 E. Lawson; Cpl. R. Leigh; Sgt. F. W. Lewis; L.A/C. A. H. B. MacKay; A/C.2 D. McMillan; Sgt. G. Nicol; A/C.1 A. R. Parsons; Sgt. K. G. Patrick; L.A/C. N. A. W. Presland; Sgt. J. F. S. Ritchie; P/O. S. M. Schatzberg; Sgt. R. A. Shaw; Cpl. F. W. Shenton; Sgt. W. S. Sprent; Sgt. J. E. C. A. Steele-Nicholson; Sgt. V. F. Talley; P/O. P. O. Thomas; Sgt. F. Thompson; Sgt. D. E. Warner; Act. P/O. H. T. Weller-Poley; A/C.1 A. G. Windle; Sgt. P. B. E. Woodham, Sgt. F. W. York.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. A. J. Knapp; Sgt. A. W. Lavender; Sgt. N. Ranganatha; Flt. Sgt. J. G. Shandley.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW REPORTED KILLED ON ACTIVE SERVICE.—L.A/C. K. J. Garmston.

WOUNDED OR INJURED ON ACTIVE SERVICE.—L.A/C. E. F. G. Clark; P/O. M. T. S. Davis; Act. Sgt. A. F. W. Farley; Sgt. I. I. Gass; Flt. Lt. A. V. Gowers, D.F.C.; Sgt. A. L. Hardy; Sgt. E. A. J. King; Cpl. J. Todd.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—L.A/C. A. Forrester.

DIED ON ACTIVE SERVICE.—Cpl. C. J. Anderson; Cpl. D. H. Barnes; A/C.2 T. Baythorpe; L.A/C. H. E. Brooker; L.A/C. W. A. Brooks; L.A/C. T. Connelly; Sgt. G. C. Cowley; L.A/C. W. Gilchrist; Flt. Sgt. J. H. Goodchild; L.A/C. A. J. Herbert; L.A/C. E. R. Hill; A/C.1 W. R. Jackson; A/C.1 R. M. James; L.A/C. J. A. Johnston; Sgt. R. Laidlow; A/C.1 G. Macd. Lindsay; A/C.2 F. R. MacKenzie; L.A/C. D. C. R. W. Rotes.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—A/CW.2 I. E. Perham.

Royal Australian Air Force

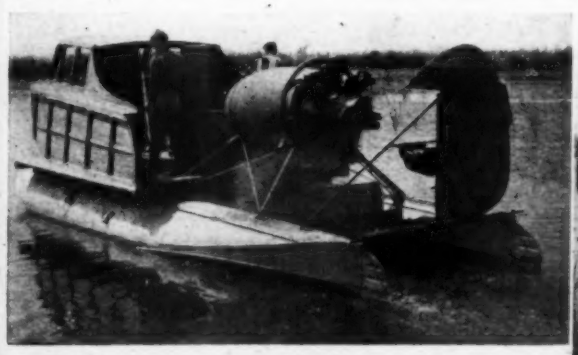
KILLED IN ACTION.—F/O. G. T. Risbey; Sgt. W. P. J. Gregory-Coleman; P/O. J. C. Frankcomb; P/O. J. W. P. Walker.

WOUNDED OR INJURED IN ACTION.—Sgt. J. E. Francis; P/O. W. D. Leek.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. A. R. Downe.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. A. H. Beesley; P/O. S. F. Belbin; Sgt. J. G. Crockett; Sgt. E. L. Davies; Sgt. R. P. Dobson; Sgt. N. C. Holdaway; Sgt. W. D. Pierce; Sgt. C. R. Podmore.

FOR NILE DELTA RESCUES



Two views of an improvised "hydroglisseur" made by the Air/Sea Rescue units of the Middle East. Drawing only a few inches of water, it is able to venture into almost any part of the Nile Delta when out on its rescuing missions.

SERVICE AVIATION

MISSING.—Sgt. N. G Bass; Sgt. R. Brook; Sgt. A. E. Carson; P/O. W. Dillon; P/O. R. D. Elrington; Sgt. E. N. Hare; Sgt. R. J. Munro; P/O. F. E. Parsons; P/O. F. C. Pinfold; Sgt. J. A. Smith; F/O. J. F. Summers; P/O. N. A. Taylor.

KILLED ON ACTIVE SERVICE.—Sgt. W. J. P. Fletcher; Sgt. J. G. Milne; Sgt. J. A. Turnbull.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. P. N. O'Sullivan.

Royal Canadian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. M. Duncan.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Lt. J. L. Mitchell.

MISSING, BELIEVED KILLED IN ACTION.—P/O. J. A. Arbuckle; Act. W/O. T. B. Barnhill; Sgt. L. J. Lafleur; Sgt. N. R. Mitchell; Sgt. J. S. Orr; Sgt. L. J. W. Ross; Sgt. A. Roy; P/O. R. A. Shires; Wing Cdr. J. D. Twigg.

MISSING.—Sgt. A. G. Amlon; Sgt. R. H. Culp; Sgt. H. C. Empey; Flt. Sgt. D. Fletcher; Sgt. C. W. Keddy; Sgt. I. C. Lamont; Sgt. J. Paterson; Flt. Sgt. W. J. Porritt; Sgt. R. J. Thompson.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Sgt. H. M. Gregory.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. H. Casimiri; P/O. A. H. I. Fawcett; Flt. Sgt. D. H. Halstead; Flt. Sgt. F. A. C. Macauley; W/O. J. W. O'Brien; P/O. H. L. Spangler.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. A. Lyon.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Flt. Sgt. F. J. Levesque.

DIED ON ACTIVE SERVICE.—Sgt. R. M. Lount.

Royal New Zealand Air Force

KILLED IN ACTION.—Sgt. L. J. S. Bush; Sgt. S. H. Ives; Sgt. E. T. Pellow.

MISSING, BELIEVED KILLED IN ACTION.—F/O. J. Lowrie; W/O. H. M. Thompson.

MISSING.—Flt. Sgt. S. J. Gallagher; Sgt. J. T. V. Gill; Sgt. J. D. Gordon; Sgt. H. L. Grant; Sgt. R. A. W. Newman; Sgt. R. E. Renton.

KILLED ON ACTIVE SERVICE.—Sgt. A. W. Allen; Sgt. R. G. McCarthy.

South African Air Force

KILLED IN ACTION.—Lt. B. R. Douglas; Maj. T. B. Whelehan.

WOUNDED OR INJURED IN ACTION.—Capt. W. P. Stanford; Lt. K. C. Whyte.

MISSING.—Lt. R. Cameron; Sgt. V. E. M. England; Capt. J. P. Furstenburg; Flt. Sgt. P. L. Mathieu.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—2/Lt. L. B. Leith.

Casualty Communiqué No. 184.

Royal Air Force

KILLED IN ACTION.—P/O. W. E. G. Domaille.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. A. B. Columbine; Sgt. S. Goldsmith; Sgt. M. Gruber; Sgt. R. S. Jones; P/O. J. O. Little, D.F.M.; Sgt J. D. O'Sullivan; P/O. R. R. H. Rowe; Sgt. T. A. Stott; Sqn. Ldr. D. G. Tomlinson, D.F.C.; Sgt. D. J. Williams

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Lt. C. Cakebread; Sgt. D. W. Dewar; F/O. A. H. Hiles; Sgt. A. J. V. Holman; Sgt. C. H. Johnston; P/O. M. D'A. Mander; Sgt. G. M. Murphy; Sgt. A. Pope; Sgt. A. P. Read; P/O. R. E. S. Summers; F/O. E. H. Tomlinson.

WOUNDED OR INJURED IN ACTION.—Act. Sgt E. N. Pell.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. F. S. Howard.

—MISSING, BELIEVED KILLED IN ACTION.—Sgt. C. E. Benstead; Sgt. K. O. Bowers; Sgt. R. W Bowler; Sgt. E. T. Briggs; Sgt. W. C. Budd; Sgt. L. C. Cartwright; Sgt. D. W. Constance; Sgt. F. W. Darley; Sgt. M. C. Davies; Sgt. W. J. Davies; Sgt. D. O. R. Dawson; Sgt. G. Dennison; Flt. Sgt. D. Emeny; Sgt. J. H. Evans; Sgt. D. Fisher; Sgt. H. Flavell; Sgt. V. R. French; Sgt. J. W. Gardner; Sgt. E. A. Giles; P/O. E. L. Hage; Sgt. H. W. Hancock; Sgt. J. C. Havenhand; Sgt. E. Hilton; Sgt. K. B. Hobbs; Sgt. M. Hull; Sgt. J. W. Humphrey; Sgt. G. C. Hyde; Sgt. A. H. Jones; Sgt. K. D. Jones; P/O P. C. V. Joslin; Sgt. J. J. Kearns; Sgt. R. H. Kirkpatrick; Sgt. P. A. Lashly; W/O S. A. Levenson; Sgt. A. J. Lock; Flt. Lt. M. B. Mallet; Flt Sgt. E. J. May; P/O. J. A. H. McGlafferty P/O. S. McHugh; Sgt. J. McIlveen; Sgt. G. B. Melton; Sgt. A. J. R. Millman Flt. Sgt. F. R. Molton Flt. Sgt. S. S. Newcombe; Sgt. A. Nicholas; Sgt. K. H. Reddish; Sgt. J. W. Rowling; Sgt. A. K. Smith; Sgt. S. T. Southgate; Sgt. L. C. Tillin; Sgt. R. Vallance; Sgt. V. F. Vinnicombe; Sgt. S. C. Wedgewood; Sgt. S. R. Williams; Sgt. S. G. Young.

MISSING.—Sgt. O. K. Barclay; P/O. J. Barritt; Sgt. J. W. A. Bennett; Sgt. R. W. Catlin; Sgt. A. M. Clarke; Sqn. Ldr. R. T. Collier; Flt. Sgt. A. Comery; Sgt. A. M. F. Cook; Sgt. A. J. Cusworth; Sgt. T. C. Dewar; Sgt. F. H. J. Farrell; Sgt. T. H. Freestone; Sgt. K. Gill; Sgt. J. L. Griffiths; Sgt. P. S. Hammond; Sgt. A. E. Harring; Sgt. W. Herbert; Sgt. J. Herring; Sgt. W. C. H. Hiscock; Sgt. W. Hodgson; Sgt. D. A. W. Innes; Sgt. T. H. Kidd; P/O. C F. Kirkus; Sgt. B. P. Lunn; Sgt. G. F. Lyman-Dixon; Sgt. G. L. Marshall; Sgt. W. C. Massey; Flt. Sgt. W. G. Moore; Sgt. A. F. J. Mortimer; Sgt. R. G. Nicholls; Sgt. J. G. Phillips; Sqn. Ldr. J. Robinson; Sgt. R. J. Roy; Sgt. D. J. Rushton; P/O. A. H. G. Sandon; Sgt. A. Skinner; P/O. C. J. Stevenson; Flt. Sgt. P. Stewart; P/O T. W. Sutton; P/O. E. F. Thomas; Act. Flt. Lt. T. F. Tyrrell; Sgt. B. B. Warren; P/O. D. M. Wilson; Sgt. F. H. Wilson.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Flt. Sgt. A. C. Alberry; Sgt. J. V. Glansfield; Act. Wing Cdr. R. O. M. Graham, D.F.C.; A/C.2 C. Gutteridge; Sgt. G. B. Hardman; P/O. J. T. Howdle; P/O. A. D. C. Jenkins; Sgt. W. Kelly; Sgt. E. E. Lace; Sqn. Ldr. J. A. H. Parker; W/O. A. E. Turley.

KILLED ON ACTIVE SERVICE.—A/C.1 K. G. Bowler; Sgt. S. Davison; L.A/C. D. A. Gell; Act. F/O. M. R. Moorley; Sgt. E. C. Perkins; L.A/C. L. W. Roper; L.A/C. W. H. F. Smale; L.A/C. J. F. Tennian; Sgt. F. Witt.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW REPORTED KILLED ON ACTIVE SERVICE.—A/C.1 D. F. Curtis.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. S. P. Lister.

DIED ON ACTIVE SERVICE.—A/C.1 G. E. Atkinson; A/C.1 C. Aveyard; Cpl. J. F. Brown; Flt. Sgt. G. O. Clement; A/C.1 L. C. Doughton; Sgt. J. R. Edwards; A/C.1 G. J. Lanyon; A/C.1 A. Marten; W/O. D. C. Peacock; A/C.2 V. N. Pulling; Sgt. N. L. Streeter; A/C.1 R. Whiffen; Cpl. J. W. Witney.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—P/O. R. G. Bennett; Sgt. R. O. L. Humphreys.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. P. R. V. Sullivan.

MISSING, BELIEVED KILLED IN ACTION.—P/O. G. R. Dibbs; Sgt. A. I. L. Downs; Sgt. R. G. McCauley; P/O. C. H. D. Moseley; Sgt. J. H. Murphy; Sgt. C. C. Ogilvie; P/O. E. C. Parton; Sgt. J. C. Pearson; Sgt. G. C. Thomson; P/O. H. J. Thomson.

MISSING.—Flt. Sgt. K. C. Bennett; Sgt. E. K. F. Brasher, D.F.M.; Sgt. A. D. Crowther; Sgt. W. F. Higson; Sgt. D. W. Johnson; Flt. Sgt. G. Littlejohn; Sgt. S. Marsden; Sgt. W. J. J. C. Monk; Sgt. E. H. Riding; P/O. N. H. Shillabeer.

Royal Canadian Air Force

KILLED IN ACTION.—Sgt. A. T. Drennan; P/O. J. F. Lawless; P/O. T. B. T. Moore; Sgt. W. J. North; Flt. Sgt. J. R. Rozon; Flt. Sgt. S. F. Santy.

CONCENTRATED DEFENCE : The searchlights of Gibraltar turn night into day on the approach of raiders.

WOUNDED OR INJURED IN ACTION.—P/O. W. E. King.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. T. P. Allenby; Sgt. G. S. Bickerton; Sgt. J. L. Blair; Sgt. J. H. Charron; Sgt. G. E. C. Coldron; Sgt. F. W. Gennette; Sgt. R. Grabek; Sgt. J. B. Higginson; Sgt. F. W. Kidson; P/O. D. C. King; Sgt. J. J. Labossiere; Sgt. M. K. Matson; Sgt. A. B. McLellan; Flt. Sgt. G. E. Milligan; Sgt. D. Murray; P/O. L. Poch; Sgt. J. C. Scotten; Sgt. C. A. Sherman; Sgt. J. H. B. Woolgar.

MISSING.—Sgt. F. Carruthers; Sgt. J. F. Cooper; Sgt. J. E. Evans; P/O. H. G. Harwood; Sgt. D. R. Philp; Sgt. R. A. Salchenberger; Act. Flt. Lt. J. Whitham; Sgt. G. R. Wright.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Act. Flt. Lt. J. F. Maguire.

KILLED ON ACTIVE SERVICE.—Sgt. F. H. Dowland; Sgt. R. A. Jackson; Flt. Sgt. A. R. McDonald; Sgt. G. B. Robb; Sgt. W. R. Robb; Sgt. A. J. Temple; Sgt. P. N. Templeton.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. R. J. Bowes; Sgt. J. M. Kassaneff.

Royal New Zealand Air Force

KILLED IN ACTION.—Sgt. W. P. O'Halloran.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. A. W. S. Evans.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. F. G. Barber; Sgt. I. H. Reeves.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. T. E. Coles; P/O. K. J. Devlin; Sgt. R. E. Graham; Sgt. W. F. Kelcher; Sgt. T. O. Metcalfe; F/O. R. P. Round; Sgt. M. V. Tate; Sgt. D. J. Walshe.

MISSING.—P/O. J. E. Barton; Sgt. H. V. G. Crawford; P/O. P. S. Duff, D.F.C.; Flt. Sgt. L. A. Groves; Sgt. C. J. F. Jarvis; P/O. G. W. A. Mills; Flt. Sgt. W. R. Parkes; Sgt. G. H. Rose; Sgt N. P. Saul; Sgt. G. W. Sharman; Flt. Sgt. E. G. Wilson.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—P/O. T. A. Dixon.

KILLED ON ACTIVE SERVICE.—Sgt. A. J. Craig; W/O. D. F. P. Jannings; Sgt. F. T. Martyn.

South African Air Force

WOUNDED OR INJURED IN ACTION.—2/Lt. M. B. Hall.

MISSING.—Capt. E. N. Colman; Lt. J. H. Haire; Lt. F. O. Noome; Lt. W. F. Turnbull.

DIED ON ACTIVE SERVICE.—Air Mech. J. F. Steyn.

Indian Air Force

DIED ON ACTIVE SERVICE.—A/C.2 S. Karanbir.

OFFICIAL AMENDMENT TO CASUALTY COMMUNIQUÉ No. 149.

Under the heading "KILLED IN ACTION" for Sgt. R. Bertram read P/O. R. Bertram.